DIESSE DIAGNOSTICA SENESE S.P.A.

VES-MATIC 20
VES-MATIC 20 PLUS

Service Manual

Release 1.00 - English

Automatic instrument for the determination of the erythrosedimentation rate (ESR)

(patent pending)

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Appendix I: LAYOUT FOR ELECTRONIC CONTROL BOARD AND SCHEMATICS

1. VES MATIC 20 / VES MATIC 20 PLUS - INTERVENTION PROCEDURES (TROUBLE SHOOTING)

Before performing any type of intervention on the instrument:

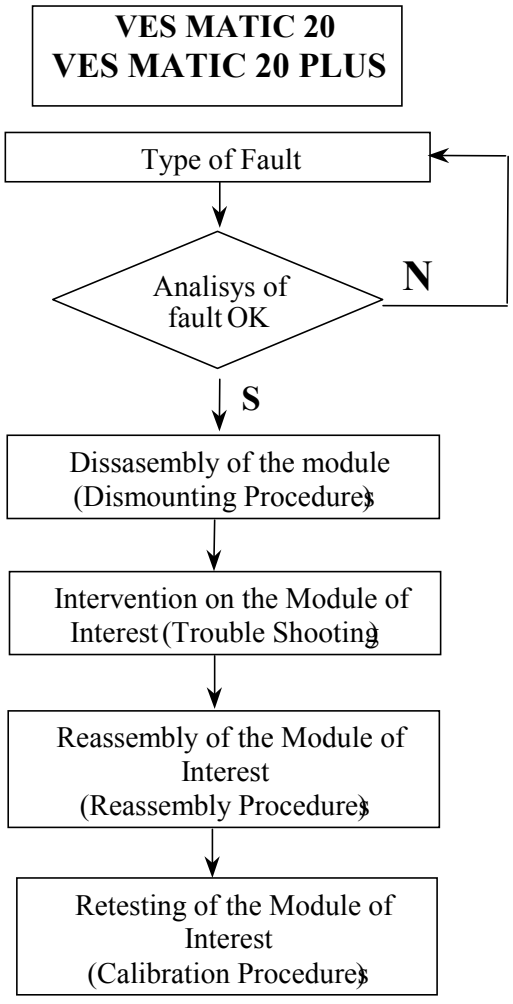
a) SWITCH OFF THE ON/OFF SWITCH ON THE VES MATIC INSTRUMENT.

b) DISCONNECT THE INSTRUMENT FROM THE POWER SUPPLY IN ORDER TO AVOID ANY RISK OF CONTACT WITH ELECTRICAL OR MECHANICAL PARTS UNDER LINE VOLTAGE.

IF THESE BASIC RULES ARE NOT FOLLOWED, THE MANUFACTURER OF THE VES MATIC 20 / VES MATIC 20 PLUS INSTRUMENT WILL ACCEPT NO FURTHER RESPONSABILITY.

1.1. APPROACH TO THE VES MATIC 20 / VES MATIC 20 PLUS INSTRUMENT

1. Observe the recommendations reported in paragraph 1.
2. Open the outer covering of the instrument.
3. Gain access to the module of interest, as described in the procedures reported hereafter (see Flow Chart no. 1).



Flow-chart n°1

1.2. ANALYSIS OF THE FAULTS

The faults reported in the following paragraphs make reference to the Trouble Shooting procedures described for the individual modules, in order to demonstrate the type of approach to follow in these situations.

1.2.1. The instrument does not switch on

a) Check that the mains power supply is working.

b) Check the power cable.

c) Check the fuses at the back of the instrument.

d) Check the ON/OFF switch on the back of the instrument.

e) Check the Power supply module (see procedure regarding Power supply).

1.2.2. The instrument switches on / Self Test

The instrument is switched on but the Self-Test is performed incorrectly, gives Error codes, or is not performed at all.

a) The Self-Test is not performed

Check that the cover is closed - Close the cover.
Check the I/O board (see 5.5. procedure).
Check the CPU board (see CPU procedure).

b) The Self-Test is performed incorrectly - Error codes are visualized.

During the Self-Test the following Error Messages may appear on the display:

1) Error reading — Error in reading of the Motor
Error in reading of the Home sensor (see 5.5. procedure)

Check the Home Sensor (see 5.5. procedure).
Check the Motors and Controls Board (see 5.5. procedure).

2) Error plate — The sample plate holder does not move up and down

Check the UP/DOWN Sensor controlling the plate position (see 5.5. procedure)
Check the cabled Motor-reducer (see 5.5. procedure)
Check the Motors and Controls Board (see 5.5. procedure)

3) Error Mixing — The Sample holder plate does not rotate

Check the Plate Motor (see 5.5. procedure)
Check the Plate Home Sensor (see 5.5. procedure)
Check the Home sensor stirrup (see 5.5. procedure)
Check the Motors and Controls Board (see 5.5. procedure)

4) Check Device exhausted — The Check Device is not working

Check the Check Device (see 5.5. procedure)
Check the Motors and Controls Board (see 5.5. procedure)

1.2.3. The unit is on/display

a) The display visualizes but does not illuminate (backlighting)

b) The display does not visualize but illuminate

c) The display does not visualize and does not illuminate

d) The display visualize but the data can not be entered with the keyboard

See Display/Keyboard module procedure (5.3.).

1.2.4. The instrument switches on / Printer

a) The paper is not fed in; the printer does not print.

b) The paper advances but the printer does not print.

c) The printer prints but the paper does not advance correctly.

d) The printer prints in the compressed form.

e) The printer prints the wrong characters (see Printer procedure 5.4).

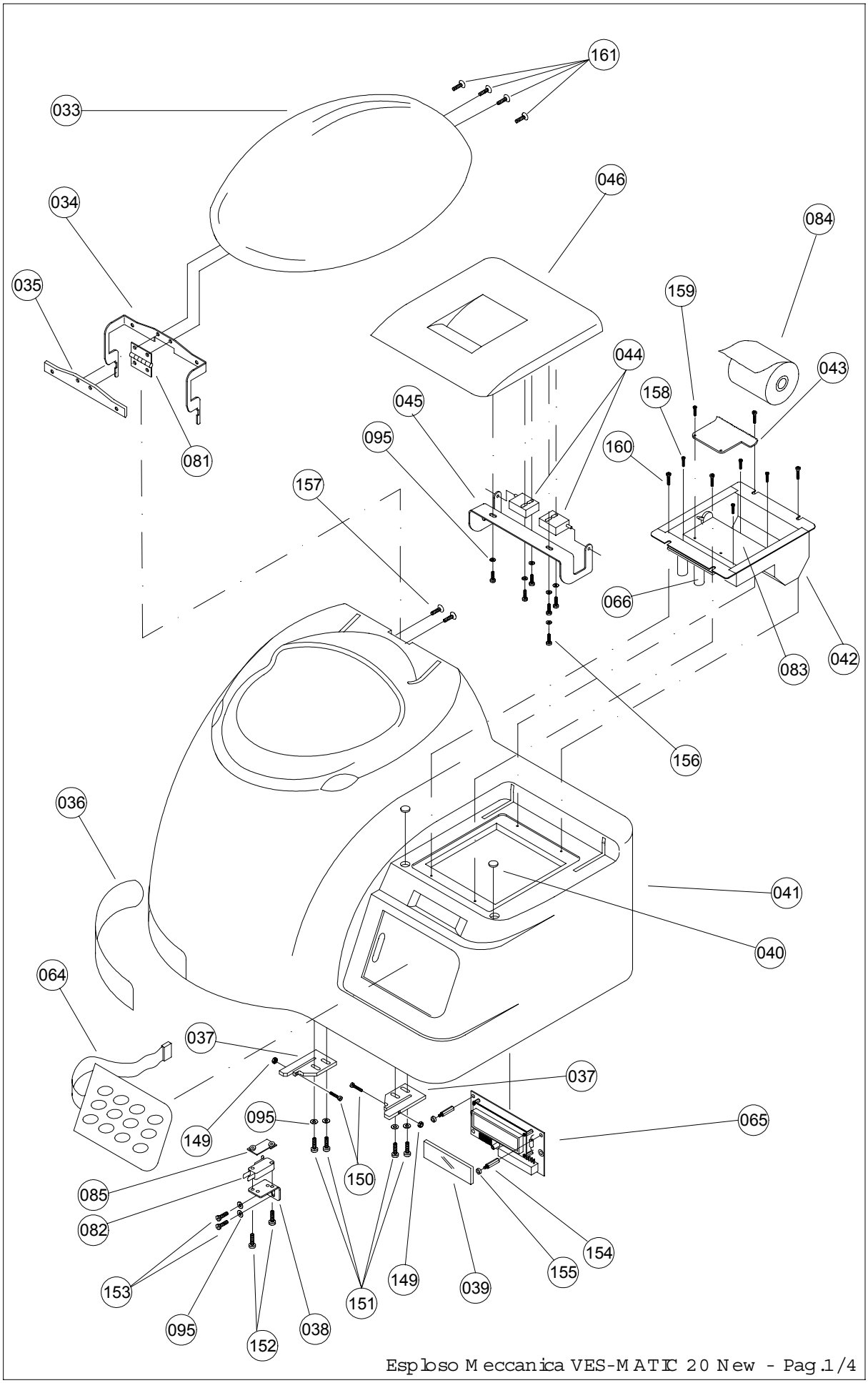
1.2.5. The instrument switches on / Check Device

a) <u>The Check Device does not charge</u>

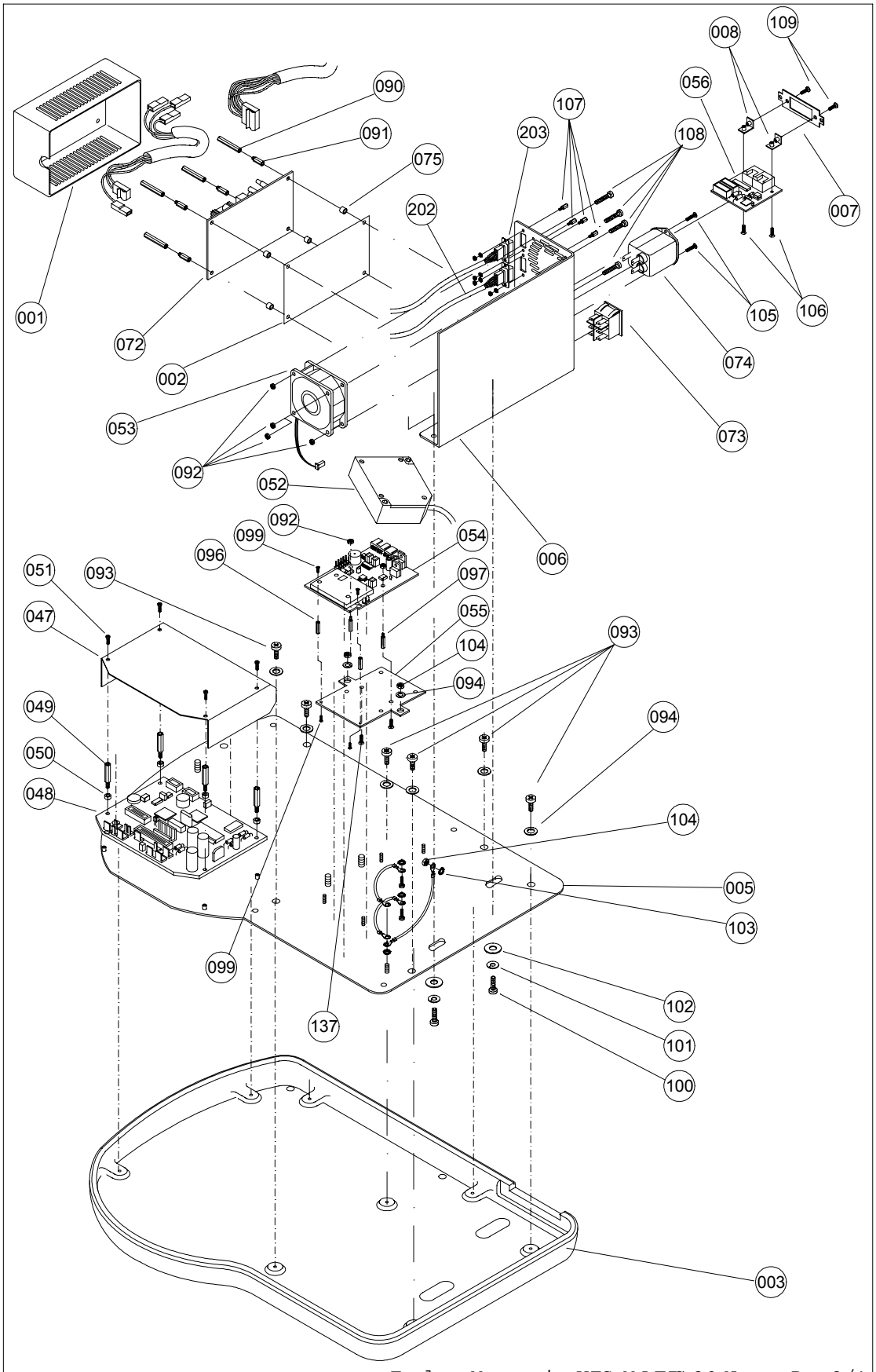
Check that the Check Device is inserted correctly:
- Switch off the instrument
- Insert a new Check Device in the Check Device holder with the label facing the operator (see operator manual, Check device procedure)
- Switch on the instrument.

If all is KO, check the Motors end Controls Board (see 5.5. procedure).

EXPLODED VIEW AND PART LIST TABLE



Esploso Meccanica VES-MATIC 20 New - Pag.1/4



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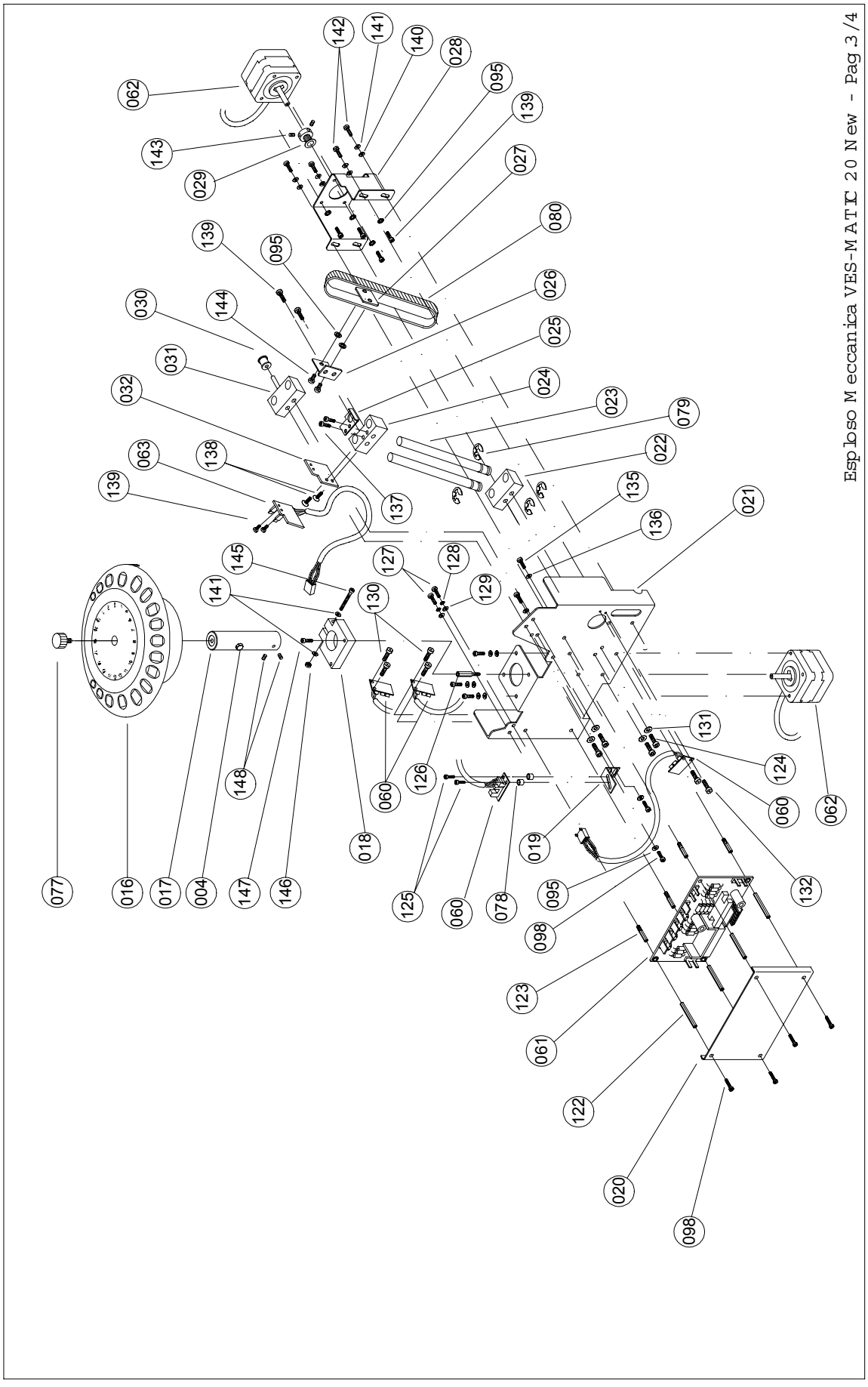
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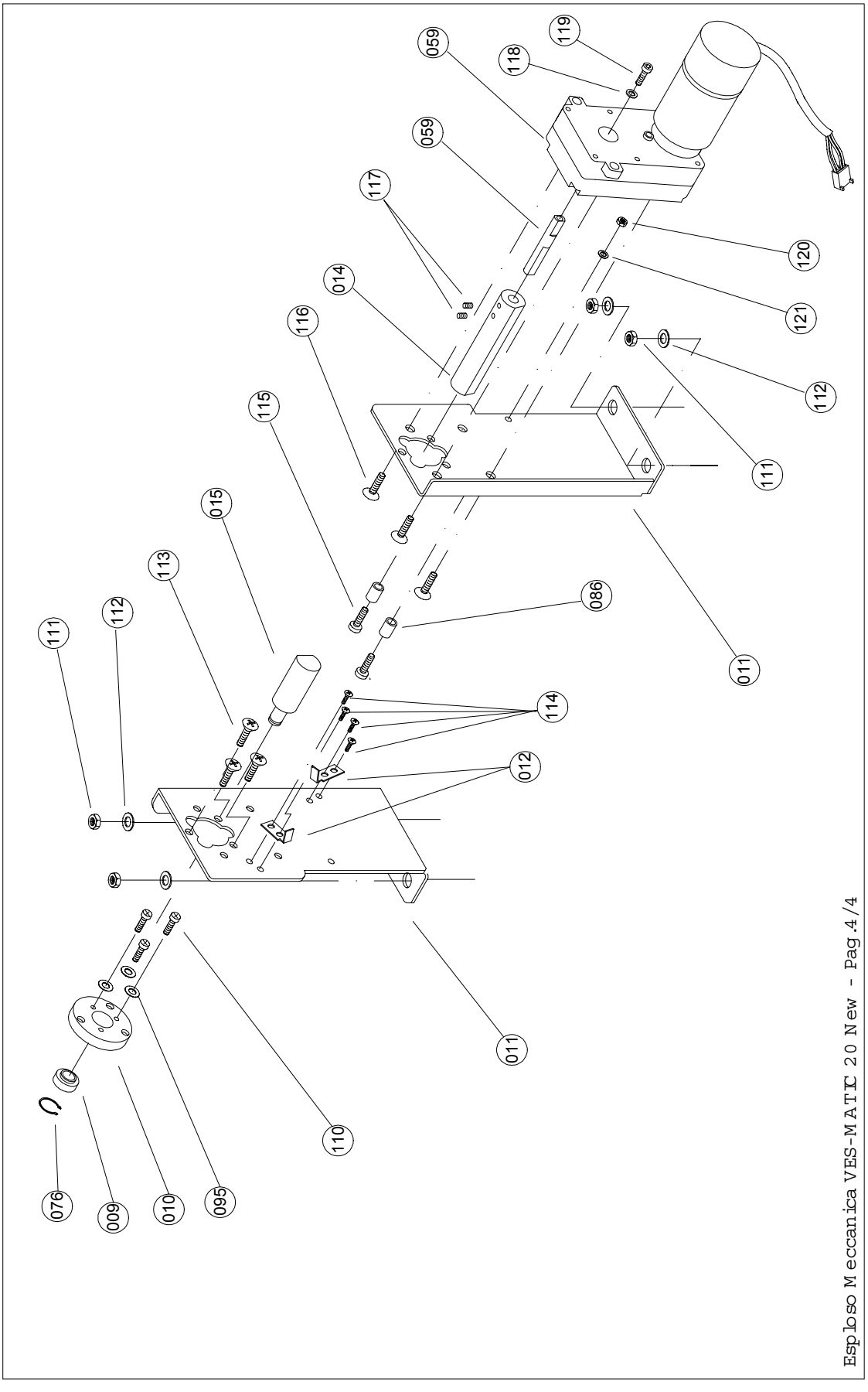

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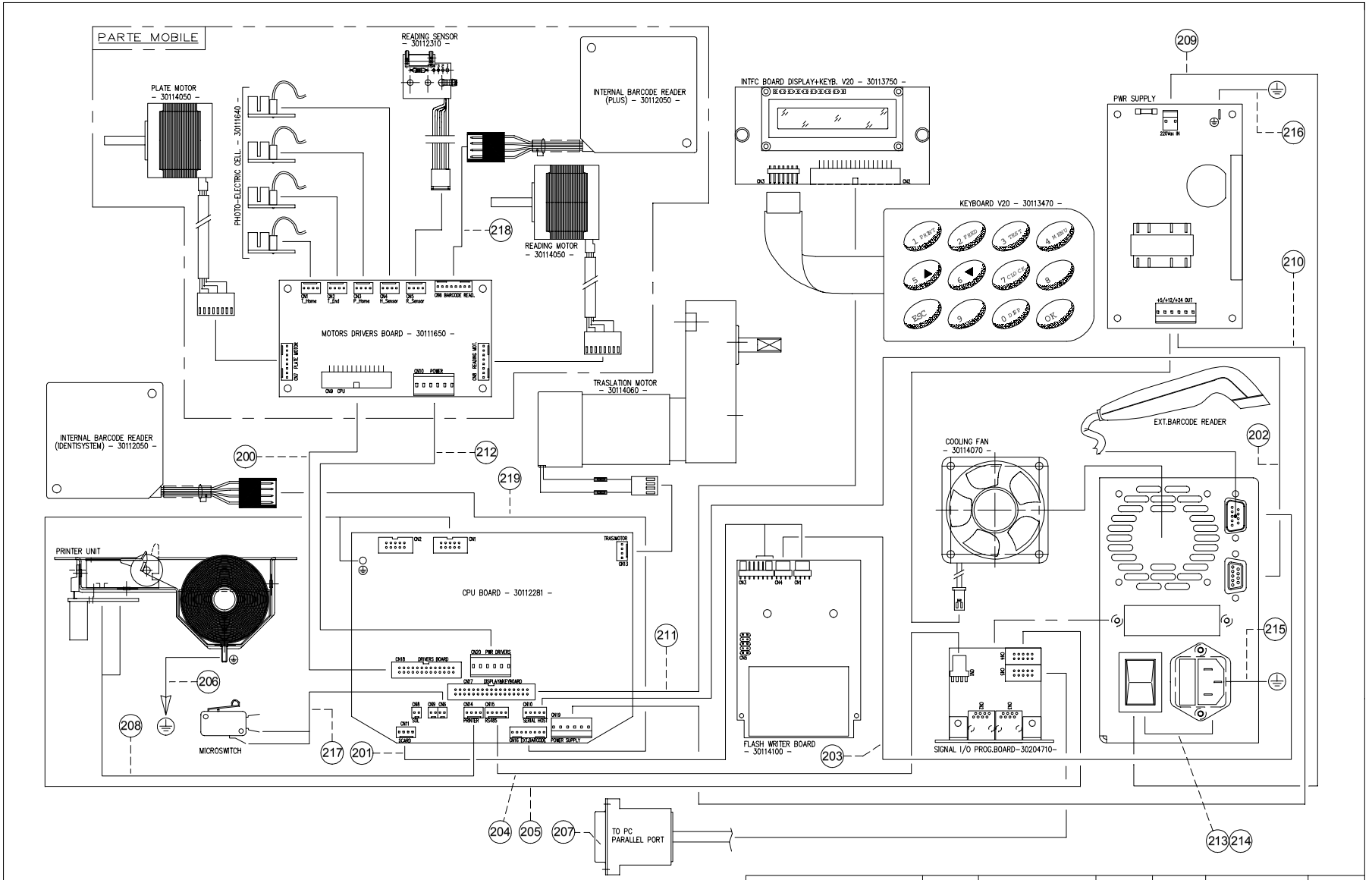

Everex	SOSTITUISCE	DATA	FIRMA	SOSTITUITO DA	DATA / FIRMA
	DATA 10/2001	DISEGN. SB	APPR.	NORM.	
	DENOMINAZIONE SCHEMA DI INTERCONNESSIONE VES-MATIC 20 NEW				
A termini di legge e' vietato riprodurre o comunicare a terzi il contenuto del presente disegno	CODICE DISEGNO 20102900	REV. 0	FOGLIO 1 di 1		

30002870 – Ves-Matic 20 New	***Part list***
30002570 – Ves-Matic 20 Identisystem	
30002830 – Ves-Matic 20 Plus	

Position	*Code*	*Description*	*Note*	
001	10325860	Case power supply		
002	10128470	Insulator pad for power supply		
003	10301290	Ves20 painted tray		
004	10126400	V20 pivot plate		
005	10327500	Ves20 new base plate		
006	10325871	Support for power supply		
007	10327880	Carter riser in/out		
008	10323970	Card support oxy/opto		
009	11504520	Spheric bearing SKF GE 8 C		
010	10325530	Upsetting pivot bush		
011	10325521	Ves20 fixed stirrup		
012	10118881	Square photocell activation		
013	30401950	Motorid. TRIAL mod.		
014	10330790	Mechanical axis support		
015	10330790	Mechanical axis support		
016	30204440	Ves20 complete plate		
017	10325581	Rotation pivot plate		
018	10127530	V20 friction plate		
019	10125590	Reset plate photocell support		
020	10327540	Cover drive card		
021	10325551	Moving mechanic support		
022	10327850	Support guide reading		
023	10119081	Group guide reading		
024	30204660	Group slide reading		
025	10125610	Read_home square		
026	10118941	Square fixing belt		
027	10118951	Plate belt clamp		
028	10325571	Motor reading supprt		
029	30401731	Tractor pulley undercarriage resding		
030	30204650	Pulley group		
031	30204680	Group support reading guide		
032	10325630	Reading sensor fixing plate		
033	10601340	Ves20 plastic bubble		
034	10127240	Bubble's zipper V20		
035	10328100	Bubble's strapV20		
036	10802110	Ves20 adhesive product		

Position	*Code*	*Description*	*Note*	
037	10127270	V20 bubble zipper guide		
038	10325840	Half-case/microswitch support		
039	10127910	V20 glass display		
040	1110F35Z	Würth 0683-284-3 (single) self-adhesive buffer		
041	10301330	Ves20 painted up case		
042	10328090	V20 painted box printer		
043	10126750	Paperbreaking		
044	30204720	Assembly fulcrum zipper printer cover		
045	10127260	Printer cover zipper		
046	10301280	V20 painetd printer cover		
047	10325850	CPU protection case		
048	30112281	CPU board Ves30/Ves20 Rev.01		
049	1110030Z	Hexagonal spacer		
050	1110F56Z	STEAB 5021/3////06 spacer		
051	11141172	Screw M3x6 UNI 7687 inox		
052	30112050	Cabled bar-code reader		
053	30114070	Fun cooler V30/V20 new		
054	30114100	Flash board writer rev.01vers.V30&V20new		
055	10328490	Flash writer fixing plate		
056	30113480	Signals board IN/OUT RS485/prog		
057				
058				
059	30114060	Motoreducer. cabl.traslation V30/V20 new		
060	30111640	Ves 20 Cabled photocell board		
061	30111650	Motors diver board		
062	30114050	Cabled Reading motor./agitat. V30/V20 new		
063	30112310	Reading sensor board		
064	30113470	Ves20 keyboard		
065	30113750	Interf. board display+keyb. Ves20		
066	30111340	Small printer board. WT01		
067				
068				
069				
070				
071				
072	21440230	Supply. Mean-Well PT65-D (+5/+12/+24)		
073	21200540	Black bip.int OMEGA I4700 16A/250V		
074	20892130	Mains input plug ACTRONIC AR-09-2F-6A		
075	1110010Z	STEAB 5021/5////05 spacer		
076	1110584R	Seeger ring E 8 UNI 7435		
077	1110008Z	ELESA B193/15P-M4x10 knob		

Position	*Code*	*Description*	*Note*	
078	1110010Z	STEAB 5021/5////05 spacer		
079	1110675Z	Benzing ring 6 UNI 7434-75		
080	11712010	1056 MXL 025 (svil. 268,386) belt		
081	12500290	Zipper art. 101 30x30 nikel.		
082	21200680	Microswitch Honeywell V5C010BG1L		
083	21430120	PrinterPANAS.EPL-1902S2AE(PAN-MEC000200)		
084	12300010	Termal printer roll l=58 mm		
085	10326070	Plate microswitch		
086	10125620	Bush of beat		
…				
…				
089	11141394	Screw M4x10 UNI 5931 inox		
090	1110023Z	Hexagonal spacer F-F M3x30		
091	1110024Z	Hexagonal spacer M-F M3x20		
092	1114473L	Nut M3 UNI 5588 inox		
093	11141394	Screw M4x10 UNI 5931 inox		
094	1114544Z	Rosetta 4x12 inox		
095	1114499Z	Rosetta 3,2x7 UNI 6592 inox		
096	1110H65Z	DIST.ESAG. F-F M2 E.ZUB. FF10 H 2040 12		
097	1110F30Z	Hexagonal spacer M-F M3x12		
098	11141182	Screw M3x8 UNI 7687 inox		
099	11160971	Screw M2x5 UNI 6109 Ot		
100	11141934	Screw M6x10 UNI 5931 inox		
101	1114B39Z	Rosetta A6,4 UNI 1751 grover inox		
102	1114505Z	Rosetta 6,4x12,5 UNI 6592 inox		
103	1114B62Z	Rosetta dentellata A4,3 DIN 6798 inox		
104	1114474L	Nut M4 UNI 5588 inox		
105	11141183	Screw M3x8 UNI 7688 inox		
106	11141183	Screw M3x8 UNI 7688 inox		
107	20814070	Kit col.fiss.conn.vasch. M/F nikel L=7		
108	11141272	Screw M3x30 UNI 7687 inox		
109	11141182	Screw M3x8 UNI 7687 inox		
110	11141172	Screw M3x6 UNI 7687 inox		
111	1114476L	Nut M6 UNI 5588 inox		
112	1114549Z	Washer 6x18 inox		
113	11141394	Screw M4x10 UNI 5931 inox		
114	11141183	Screw M3x8 UNI 7688 inox		
115	11141424	Screw M4x16 UNI 5931 inox		
116	11141383	Screw M4x8 UNI 7688 inox		
117	11141376	Screw M4x6 UNI 5923 inox		
118	1114501Z	Washer 4,3x9 UNI 6592 inox		

Position	*Code*	*Description*	*Note*	
119	11141394	Screw M4x10 UNI 5931 inox		
120	1114474L	Nut M4 UNI 5588 inox		
121	1114501Z	Washer 4,3x9 UNI 6592 inox		
122	1110026Z	Hexagonal spacer M-F M3x30		
123	1110027Z	Hexagonal spacer M-F M3x10		
124	11141404	Screw M4x12 UNI 5931 inox		
125	11141192	Screw M3x10 UNI 7687 inox		
126	1110021Z	Hexagonal spacer M-F M3x15		
127	11141402	Screw M4x12 UNI 7687 inox		
128	1114B37Z	Washer A4,3 UNI 1751 grover inox		
129	1114501Z	Washer 4,3x9 UNI 6592 inox		
130	11141174	Screw M3x6 UNI 5931 inox		
131	1114501Z	Washer 4,3x9 UNI 6592 inox		
132	1110389G	Screw PZAB 2,9x6,5 UNI 6954 Zn		
133				
134				
135	11141402	Screw M4x12 UNI 7687 inox		
136	1114501Z	Washer 4,3x9 UNI 6592 inox		
137	11141173	Screw M3x6 UNI 7688 inox		
138	11141173	Screw M3x6 UNI 7688 inox		
139	11141174	Screw M3x6 UNI 5931 inox		
140	1114501Z	Washer 4,3x9 UNI 6592 inox		
141	1114B37Z	Washer A4,3 UNI 1751 grover inox		
142	11141394	Screw M4x10 UNI 5931 inox		
143	11141176	Screw M3x6 UNI 5923 inox		
144	11141092	Screw M2,5x6 UNI 7687 inox		
145	11141484	Screw M4x30 UNI 5931 inox		
146	1110460Z	Nut autoblocking M4 UNI 7473 Zn		
147	11141242	Screw M3x20 UNI 7687 inox		
148	11141376	Screw M4x6 UNI 5923 inox		
149	1110459Z	Nut autoblocking M3 UNI 7473 Zn		
150	11141242	Screw M3x20 UNI 7687 inox		
151	11141192	Screw M3x10 UNI 7687 inox		
152	11141224	Screw M3x16 UNI 5931 inox		
153	1110389G	Screw PZAB 2,9x6,5 UNI 6954 Zn		
154	1110F42Z	Hexagonal spacer M-F M4x15		
155	1110009Z	Washer STEAB 5015/4/1//16		
156	11141182	Screw M3x8 UNI 7687 inox		
157	1110391H	Screw PZAB 2,9x13 UNI 6955 Zn		
158	1110383G	Screw PZAB 2,2x6,5 UNI 6954 Zn		
159	1110381G	Screw PZAB 2x5 UNI 6954 Zn		

Position	*Code*	*Description*	*Note*	
160	11141172	Screw M3x6 UNI 7687 inox		
161	11141183	Screw M3x8 UNI 7688 inox		
162				
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…				

---------- *Cables list*----------

Position	*Code*	*Description*	*Note*	
200	30113870	Signals motors driver cable V30/V20 new		
201	30114280	Flash writer cable Ves20		
202	30114270	Seriale cable RS232C V20		
203	30114260	Barcode reading cable ext. V20		
204	30114250	Seriale connection cable RS485 V20		
205	30114240	Internal programm. Cable ISP V20		
206	30114300	Ground cable L=400 O/O		
207	30114080	External programming cable V30&V20 e	*Optional*	
208	30113840	Printer cable V30/V20 new		
209	30114000	Power supply cable 90/264Vac Ves30/Ves20 new		
210	30113990	Power supply cable CPU/fan V30/V20 new		
211	30114290	Interface cable display+keyb. V20		
212	30113890	Power supply cable motors drivers V30/V20 new		
213	30114020	Neutral cable pin/filter Ves30/Ves20 new		
214	30114010	Fase cable pin/filer Ves30/Ves20 new		
215	30114190	Ground cable L=150 O/F		
216	30114230	Ground cable L=250 O/F		
217	30113930	Microswitch cover cable Ves30		
218	30113940	Internal cable connection bar code reader V30 new		
219	30113980	External cable connection barcode reader V30/V20 new		

2. PROCEDURE TO DISMOUNT
THE ROTATION GROUP-SAMPLE HOLDER PLATE (see figure of exploded views)
Proceed step by step as reported below

a) Follow the recommendations in paragraph 1 points a) and b)

b) Unscrew the 5 screws (pos. 089) on the base's external sides.

c) Open the outer covering (Pos. 041), lifting the front part and rotating it towards, be carefull to don't damage the internal cables.

d) Unscrew with a key the screw (Pos. 077) that bolcks the sample holder plate (pos. 016)

e) Remove the sample holder plate (Por. 016)

e) Now we have at totally disposition the instrument's mechanics for any intervention

3.PROCEDURE FOR REASSEMBLY OF THE ROTATION GROUP-SAMPLE HOLDER PLATE

Follow the procedure reported below:

3. To go backward in the procedure reported at the point N 2.

4. CALIBRATION PROCEDURE OF THE UNIT VES MATIC 20 /VES MATIC 20 PLUS AFTER THE DISASSEMBLY OR FOR THE PERIODICAL PROTOCOL.

When the unit is assemblied back keeping the carter opened:

Access to the instrument keeping pressed the button "0" of the keyboard, the instrument pages to automatically in "TEST FACTORY".
With this menù we can do test and calibration of the instrument.

Test Factory

On the diplay appears :

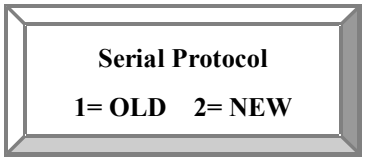
and the printer makes the print below:

* * * * * * * * * * * * * * * * * *
* FACTORY TEST *
* * * * * * * * * * * * * * * * * *

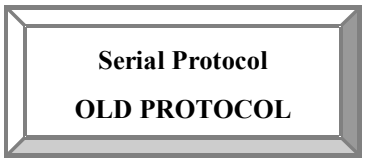
- CONTROLS –

(1) = SERIAL RS232
(2) = TEMPERATURE
(3) = CLOCK
(4) = TRANSLATOR
(5) = PLATE
(6) = SENSOR READING
(7) = ID. SETTING
(8) = CARD
(9) = BARCODE
(OK) = STRESS PLATE

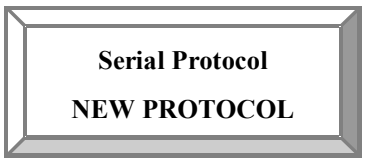
-select pressing the button "1" the voice "**SERIAL RS232**"



Pressing the button “1” of the keyboard we select the dates trasmission like on the old instruments Ves Matic 20/60 on the display appears:

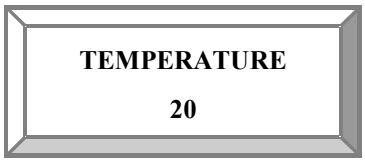


Pressing the button “2” of the keyboard we select the new dates trasmission on the display appears:



Pressing the button “OK” we confirm the effected selection.

-select pressing the button “2” the voice “**TEMPERATURE**”

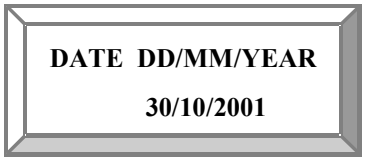


In this way appears the temperature read to the instrument, if it was different as that present in the environment operate with the trimmer RV2 placed on the cpu board (Pos. 042) turning it in clockwise we growing up the temperature, in anticlockwise it reduces it. Pressing the button “OK” we come back to the menù “TEST FACTORY” and the printer prints the temperature value put:

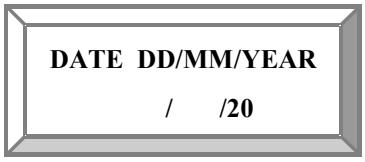
* * * * * * * * * * * * * * * * * *
* TEMPERATURE TEST *
* * * * * * * * * * * * * * * * * *

TEMPERATURE 20

-select pressing the button “3” the voice “**CLOCK TEST**”



Pressing the button “ESC” we cancel the set up date and we place the instrument for the insertion of the new date, on the display appears:



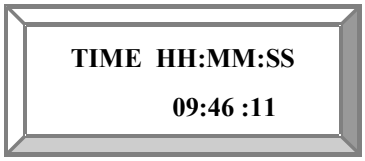
Pressing the numerical buttons we insert the day, the month then the last two figures that indicate the year.
Ex. We want to insert the date 1st Aprile 2002
Press:

For the day:
Button ”0”
Button“1”

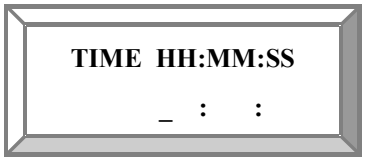
For the month
Button “0”
Button “4”

For the year
Button “0”
Button“2”

pressing the button “OK” we confirm what we have pressed, automatically the instrument places itself in the menù for to put back the hour and on the display appears:



Pressing the button “ESC” we cancel the date fixed and we put the instrument for to insert the new date,on the display appears:



Pressing the numerical buuttons we insert the hours ,the minutes, then the seconds.

Ex. We want to insert the following time 08:50:52

Pressing:

For the hours:
Button”0”
Button “8”

For the minutes:
Button “5”
Button “0”

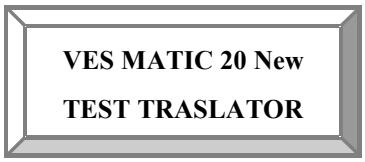
For the seconds:
Button“5”
Button “2”

Pressing the button “OK” we confirm what we have pressed, automatically the instrument updates the time , the date an the printer prints :

* * * * * * * * * * * * * * * * * *
* CLOCK TEST *
* * * * * * * * * * * * * * * * * *

DATE (dd/mm/yy) 01/04/2002
TIME (hh:mm:ss) 08:50:52

-select pressing the button “4” the voice “**TRANSLATOR**” on the display appears:



Automatically the instrument makes the upsetting sample holder plate until the shaking position after a few seconds it gets it in the vertical .
In this way we check the right working of the system and at the end the printer makes the report print:

* * * * * * * * * * * * * * * * * *
* TRANSLATOR TEST *
* * * * * * * * * * * * * * * * * *

TRANSLATOR OK

If there were some faultes the printer prints the following report:

```
* * * * * * * * * * * * * * * * * *
*     TRANSLATOR TEST     *
* * * * * * * * * * * * * * * * * *
```

TRANSLATOR KO

If test “KO” verify what below:

a) That there weren’t mechanic impediments for the traslation group rotation.
b) That to the motor (Pos. 059) the tension arrives (we read only a medium tension because the motor is drove in PWM, about 6 Volt)use a tester for to verify.
c) Verify the photocelles functionality (Pos. 060)
d) If the points a, b, c are ok continue to the CPU board replace (pos. 048) look procedure chapter 5.2 .

-select pressing the button “5” the voice “**PLATE**” on the display appears:

The printer prints in the following report:

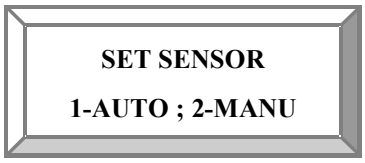
```
* * * * * * * * * * * * * * * * * *
*           PLATE TEST          *
* * * * * * * * * * * * * * * * * *
```

PLATE OK

The value that appears on the display corresponds to the step number that the machine has as ofset than the home plate sensor (Pos. 060/019). The ofset means to fix the position 1 of the sample holder plate (Pos. 016) than the reading sensor.
Pressing the button “5 Up arrow” we grow up the ofset of 2 steps, and pressing the button “6 Down arrow) we grow down the ofset of 2 steps. The smallest removing value of every buttons pression “5” and “6” is of two steps. Pressing the button “OK” the instrument makes a new

sample holder plate rotation and places itself on the new ofset set up. The display shows the new set up value. Pressing the button “ESC” we get out from the procedure and we come back to the menù “TEST FACTORY”

-select pressing the button “6” the voice “**SENSOR READING**” on the display appears:



Pressing the button“1” we place the sensor test in automatical way.

The instrument makes a reset of the sampleholder plate placing the cuvette 1 in correspondence with the reading sensor, and asks the insertion of a new cuvette with latix calibration 3, insert the cuvette and press the button “OK” (we suggest to close the door for not have external light interferences). The instrument makes some readings until when reducing the current on the emitter sensor doesn’t pierce the latix to 3. On the display appears a trimmer calibration value (about 20).

At this time the instrument asks to insert a cuvette with calibration latix 2, insert a cuvette and pressing the button “OK”.

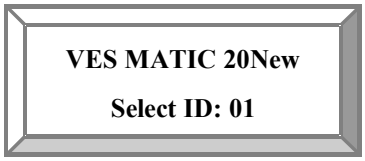
The instrument makes some readings until when regulating the current on the emitter sensor doen’t pierce the latix to 2. On the display appears for a moment the trimmer calibration value (about 40), then appears the medium value which comes calibrated the sensor, in the indicated values as the example results to be 30.

Pressing the button “2” we place the manual sensor test.

The instrument makes reset turn of the sample holder plate positioning the cuvette 1 in correspondence of the sensor reading, and shows the trimmer calibration value. Insert one cuvette with the latix calibration 3, press the button “TEST”, the instrument makes a reading that has to give the state sensor in light . For to found the limit point change the placed value with the button “5 UP ARROW “ for to grow up and “6 DOWN ARROW” for to grow down and press the button “TEST” to make the reading .

Remove the cuvette and insert the cuvette with latix calibration 2 , pressing the button “TEST” the instrument makes a reading tha has to give for result the sensor state in dark, for to found the limit point change the placed value with the buttons “5 UP ARROW” for to grow up and “6 DOWN ARROW” for to grow down, then press the button “TEST” for to make the reading.

-select pressing the button “7” the voice “**ID. SETTING**” on the display appears:



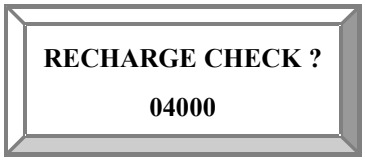
This setting is for the connection of more instruments through the serial door RS485 (min. 1 instrument, max. 32 instruments), with the program Ves-PC for Dos as a max. 6 instruments. The default'value is 01 (low value), we can change with the buttons "5 UP ARROW" for to grow up and "6 DOWN ARROW" until the value of 32. At the end of the selection press the button "OK"the printer prints the following report:

* * * * * * * * * * * * * * * * * *
* SELECT ID *
* * * * * * * * * * * * * * * * * *

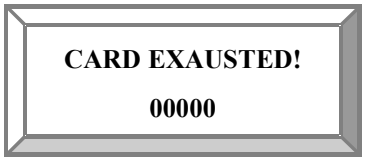
Number ID : 1

-select pressing the button "8" the voice "**CARD**" on the display appears:

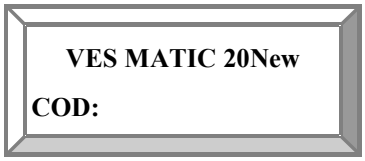
With this menù we can check the right work of the check device reader or of the paper that acts to check device. Insert the Check Device in the special place, with the arrow put in the direction of the instrument and the white side with Diesse green logotype in up direction. Press a button's keyboard and on the diplay appears :



Pressing the button "OK" we have the reloading of 4000 strokes of the check device, pressing the button "ESC" we get out from the menù without reloading the 4000 strokes of the check device in the instrument's memory. If we insert a check device without strokes on the display appears:



-select pressing the button “9” the voice “**BARCODE**” on the display appears:



With this menù we can verify the barcode working for the instruments in version IDSYSTEM. After the selection the instrument overturns the sample holder plate in a way it can take it in the bar code reading position, pressing the button “5 UP arrow” we make turn the sample holder plate of one position in anticlockwise, pressing the button “6 DOWN arrow” we make turn the sample holder plate of one position in colckwise.
After have placed a cuvette with the bar code in front of bar code press the button “3 TEST” for to turn on the reader if it comes read on the display appears in clear the barcode value. Pressing the button “ESC” we get out from the menù and we come back TEST FACTORY

-select press the button “0”the voice “**STRESS READING**” on the display appears:

The instrument makes a reset of sample holder plate in a way to place the cuvette 1 in correspondence of the reading sensor and starts to make slide the reading sensor trolley for all the run. This test is useful in disassembly and assembly case of the reading group, in way to verify in automatic the right movement. Fot to finish the test press the button “ESC”.

-select pressing the button “0” the voice “**STRESS PLATE**” on the display appears:

The instrument makes a reset of the sample holder plate in a way to place the cuvette 1 in correspondence of the reading sensor and starts to make wheel the sample holder plate in every

position, at every stop comes made a trolley reset, that brings the reading sensor. This test is useful in assembly and disassembly case of the sample holder group plate for to verify in automatically the right movement. For to finish the test press the button “ESC”.

5. PROCEDURES TO FOLLOW FOR INTERVENTIONS ON THE DIFFERENT MODULES

5.1. SERVICE MANUAL THE POWER SUPPLY MODULE (Pos. 072)

5.1.1. General
5.1.1.1. Aim
5.1.1.2. Applicability
5.1.2. Relative documentation
5.1.3. Relative instrumentation
5.1.4. Trouble shooting
5.1.4.1. Description of the module
5.1.5. Flow Chart no. 2
5.1.6. Access to the module
Appendix A: Examination of the faults

5.1. SERVICE MANUAL THE POWER SUPPLY MODULE (Pos. 072)

5.1.1. General

5.1.1.1. Aim

The present document furnishes details of the Trouble Shooting procedures regarding the Power supply module (Pos. 072), assembled on the VES MATIC 20 / VES MATIC 20 PLUS instrument.

5.1.1.2. Applicability

The recommendations contained in the present document are applicable for use in the final service check-up to ascertain the acceptability of the instrument.

5.1.2. Relative documentation

20102900 Scheme of the VES MATIC 20 / 20 PLUS system (in the current edition).

5.1.3. Relative instrumentation

Multimeter Mod. FLUKE 8010A or equivalent.

Philips Laboratory Oscilloscope or equivalent.

Standard laboratory welder.

3-4 mm screw-drivers, pliers, standard laboratory tools.

5.1.4. Trouble shooting

5.1.4.1. Description of the module

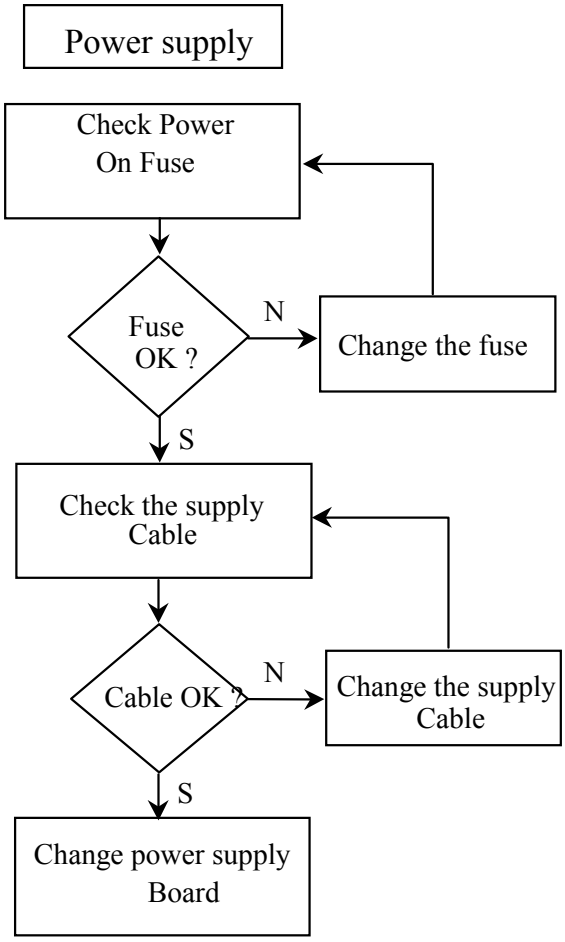
The power supply form has made from a multifrequency multitension switching power supply that distributes the right tensions for the instrument working.
The tensions accepted in entry are:
Vca from 90 to 264 Volt
Work frequency from 44 to 440 Hertz
P Max d.c 65 Watts

The tensions supplied in exit are the following:

+5 Vdc n°1 red cable
+12 Vdc n°1 orange cable
+24 Vdc n°1 blu cable
Gnd n°3 black cable

5.1.5. Flow Chart no. 2

Trouble shoooting phase in relation to the Power Supply module (Pos. 072).



5.1.6. Access to the module

a) Disconnect the VES MATIC 20 / VES MATIC 20 PLUS instrument from the power supply, as reported in paragraph 1.

b) Remove the outer covering as reported in paragraph 2 in order to gain access to the internal parts.

c) Unscrew the screw and remove the case (pos. 001)

d) Disconnect the cable connected on Power Supply (pos. 209, 210, 216)

e) Unscrew the Hexagonal spacer (pos. 090 and 091).

f) Remove the Power Supply module board.

g) Replace the faulty power supply board whith another new.

Appendix A: Examination of the possible faults

The examination of the main defects is performed according to the table reported below:

Type of failure	The voltage is not coming through on connector pos. 209
Local effect	The indicator LEDs of CPU board (pos. 048) are off.
General effect	No voltage is going out to the different connectors.
Action	1. Ensure that the unit is correctly connected to the mains power supply. 2. Check the fuse and the cable; replace if necessary.

Type of failure	The LEDs of CPU board are off even though the voltage is present on cable pos. 209.
Local effect	The indicator LEDs are off.
General effect	There is no exit voltage for the power supply board pos. 072
Action	1. Ensure that the cable pos. 210 is correctly connected to the power supply and the CPU board. 2. Check if there is voltage at the exit of the power supply board, replace if necessary.

5.2. SERVICE MANUAL CPU MODULE (Pos. 048)

5.2.1. General

5.2.1.1. Aim

5.2.1.2. Applicability

5.2.2. Relative documentation

5.2.3. Relative instrumentation

5.2.4. Trouble shooting

5.2.4.1. Description of the module

5.2.5. Flow Chart no. 3

5.2.6. Access to the module

Appendix B: Examination of the faults

5.2. SERVICE MANUAL CPU MODULE (Pos. 048)

5.2.1. General

5.2.1.1. Aim

The present document reports in detail the Trouble Shooting procedures regarding the CPU unit code 30100020, assembled on the VES MATIC 20 / VES MATIC 20PLUS instrument.

5.2.1.2. Applicability

The recommendations reported here below are applicable in the final service check to ascertain acceptability of the product.

5.2.2. Relative documentation

20102900 Scheme of the VES MATIC 20 / 20 PLUS system (current version).

20102631 Electric scheme of the CPU module.

30112281 Layout of the CPU module.

5.2.3. Relative instrumentation

Multimeter Mod. FLUKE 8010A or equivalent.

Philips Laboratory Oscilloscope or equivalent.

Standard laboratory welder.

3-4 mm screw-drivers, pliers, standard laboratory tools.

Power Supply (Pos. 072).

5.2.4. Trouble shooting

5.2.4.1. Description of the module

The CPU board controls all the peripherals connected to it. It can be subdivided into the following blocks:

a) MPU & CONTROL ADDRESS/DATA BUS IC1 ATMEGA 103

b) MEMORY IC3 RAM 62256

c) DECODER IC17 EPM3064

d) SERIAL PORT /BAR CODE IC13, IC14, IC15 MAX 202 or equiv.

e) POWER SUPPLY CN19 MOLEX

a) MPU and CONTROL ADDRESS/DATA BUS Block

This block includes the microprocessor which performs the functions according to the resident programme. It contains a system clock of 6 Mhz and a bus speed (speed at which an operation is performed) of 6 Mhz.

b) MEMORY Block

FlashEprom	This is integrated in the CPU processor which contains the control programme. The memory has a capacity of 128 KByte x 8Bit.
SRam	I.C. where the MPU temporarily transfers data or variables, with random access.

c) DECODER Block

The CPLD (Complex Programmable Logic Device) present in this block is responsible for the decoding functions.

d) SERIAL PORT block & BAR CODE

The serial comunication has made from the devices MAX202 or eq. where in its internal there is the necessary for to have a negative tension value and larger amplitude even if it has a feeding not larger than 5V. The dates relatives to the serial door are setting from the program so are fixed in the following:

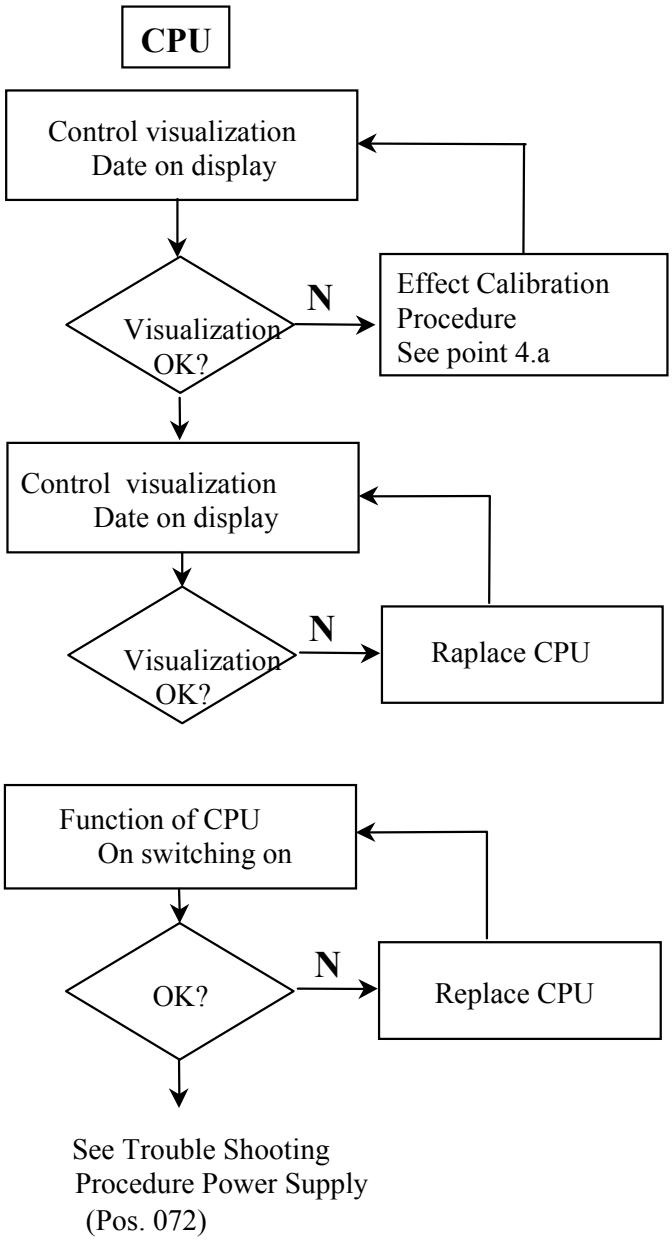
SPEED	9600 BAUD (septable 19200 or 38400 bps)
PARITA'	NOTHING
BITS LENGHT	8
STOP BITS	1

e) FEEDING block

The necessary tension for the working of the board +5V and it ‘s inserted through the connector J19.

5.2.5. Flow Chart no. 3

Il Flow Chart n°3 mostra il diagramma di flusso per quanto riguarda la CPU pos. 048



5.2.6. Access to the module

a) Disconnect the VES MATIC 20 / VES MATIC 20 PLUS from the power supply, as in paragraph 1.

b) Gain access to the inside of the instrument as reported in paragraph 2.

c) Losen the screw pos. 051 and remove the case pos. 047

d) Disconnect the cable on CPU board pos. 048

e) Unscrew the hexagonal spacer pos. 049

f) Remove the CPU board module pos. 048

g) Replace the faulty components, as reported in Appendix B.

Appendix B: Examination of the possible faults

An examination of the main defects is performed according to the table reported below:

Type of failure	The timer is not working.
Local effect	The clock on the display is not updated.
General effect	The date is not memorized in the instrument.
Action	1. Replace the CPU board.

Type of failure	The timer is not working.
Local effect	The RAM works.
General effect	The date is not memorized in the instrument.
Action	2. Replace the CPU board.

Type of failure	The program does not start up, or anomalies appear when switching on the instrument.
Local effect	The display does not visualize anything, or gives wrong information.
General effect	It is not possible to use the Ves Matic. There is no visualization on the display, or incorrect characters appear.
Action	1. Replace the CPU board.

5.3. SERVICE MANUAL DISPLAY/KEYBOARD MODULE (pos. 064/065)

5.3.1. General

5.3.1.1. Aim

5.3.1.2. Applicability

5.3.2. Relative documentation

5.3.3. Relative instrumentation

5.3.4. Trouble shooting

5.3.4.1. Description of the module

5.3.5. Flow Chart no. 4

5.3.6. Access to the module

Appendix C: Examination of the faults.

5.3. SERVICE MANUAL DISPLAY/KEYBOARD MODULE (Pos. 064/065)

5.3.1. General

5.3.1.1. Aim

The present document reports details of the Trouble Shooting procedures relating to the Display/Keyboard module pos. 064 and 065 assembled on the VES MATIC 20/VES MATIC 20 PLUS.

5.3.1.2. Applicability

The recommendations contained in the present document are applicable to final servicing to ascertain the acceptability of the product.

5.3.2. Relative documentation

20102900 Scheme of the VES MATIC 20 / VES MATIC 20 PLUSsystem (in the current edition).

20102850 Schema of the connection of the Display/keyboard interface Vesmatic 20

30111660 Layout of the display/keyboard module Vesmatic 20
30113470 Layout of the keyboard module Vesmatic 20.

5.3.3. Relative instrumentation

Multimeter Mod. FLUKE 8010A or equivalent.

Philips Laboratory Oscilloscope or equivalent.

Standard laboratory welder.

3-4 mm screw-drivers, pliers, standard laboratory tools.

Power supply (Pos. 072).

CPU board (Pos.048).

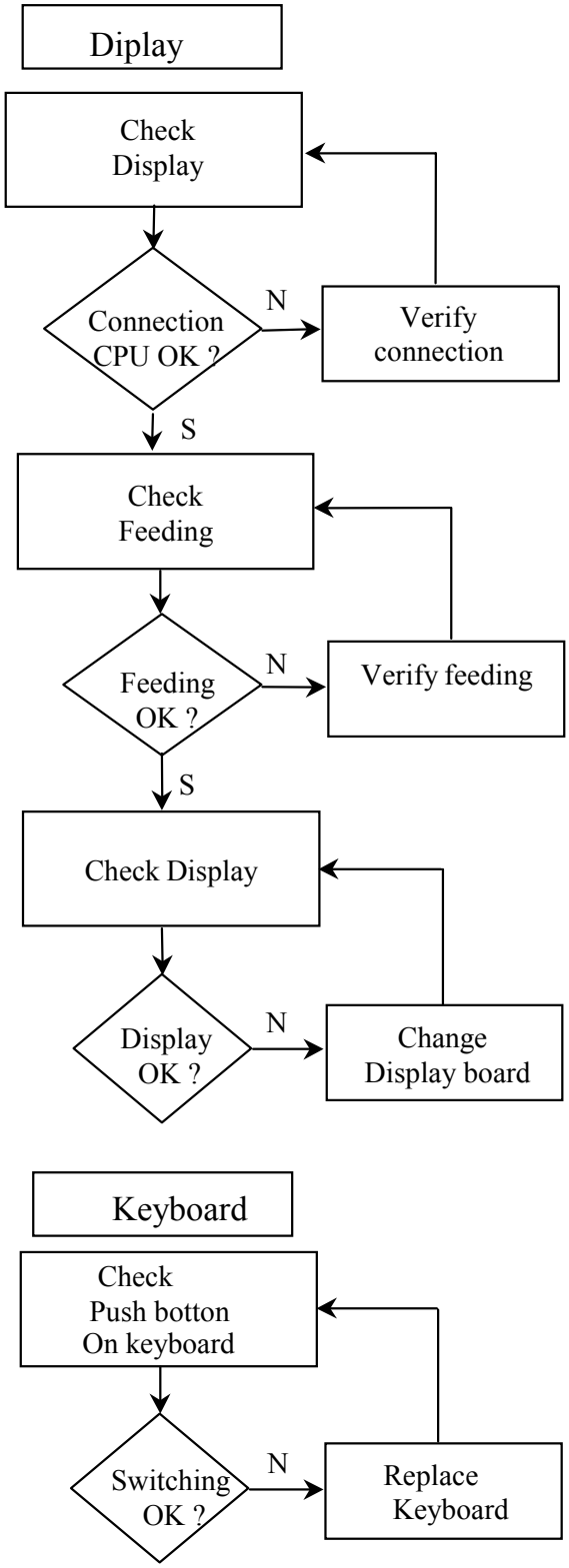
5.3.4. Trouble shooting

5.3.4.1. Description of the module

The Display/Keyboard form pos. 064/065 has made from the display display+keyboard boards and from the keyboard . It's interfaced from the CPU pos. 048 through the cable pos. 211, and this CPU have to be connected for to make work the form.

5.3.5. Flow Chart no. 4

The Flow Chart n° 4 shows the flow chart for the Trouble Shooting part's form Display/Keyboard pos. 064/065.



5.3.6. Access to the module

a) Turn off the feeding to the VES MATIC 20 / 20 PLUS like paragraph 1.

b) Come in to the unit opening the plug like paragraph 2.

c) Take off the interface cable connected on the board's connector CN2 pos. 065.

d) Unscrew the crews (pos. 154) on the board pos. 065 .

e) Take off the Display/Keyboard board pos. 065, taking off the cable that connectes the board to the display (CN3).

f) Change the components damaged like the Appendix C.

g) If the buttons 's keyboard board don't function verify the working with a setted tester, in a way to verify the continuity.

Appendix C: Examination of the possible faults

An examination of the main defects is performed according to the table reported below:

Type of failure	There is no visualization.
Local effect	The keyboard works and voltage is present in the display; the CPU works.
General effect	No characters appear on the display.
Action	1. Check that the display and CPU are connected to each other. 2. Replace the Display.

Type of failure	There is no visualization.
Local effect	The keyboard works and the CPU is correctly connected.
General effect	No characters appear on the screen.
Action	Check the power to the display.

Type of failure	There is no visualization.
Local effect	The keyboard works and power is present at the display; the CPU works.
General effect	No characters appear on the display.
Action	Replace the display.

Type of failure	Data cannot be introduced.
Local effect	The display and CPU are working.
General effect	There is no switching on the keys.
Action	Change the keyboard.

5.4. SERVICE MANUAL PRINTER INTERFACE MODULE Pos. 066

5.4.1. General

5.4.1.1. Aim

5.4.1.2. Applicability

5.4.2. Relative documentation

5.4.3. Relative instrumentation

5.4.4. Trouble shooting

5.4.4.1. Description of the module

5.4.5. Flow Chart no. 5

5.4.6. Access to the module

Appendix D: Examination of the faults.

5.4. SERVICE MANUAL PRINTER INTERFACE MODULE (Pos. 066)

5.4.1. General

5.4.1.1. Aim

The present document reports in detail the Trouble Shooting procedures to be used in relation to the Printer Interface Module pos. 066, assembled on the VESMATIC 20 / VES MATIC 20 PLUS.

5.4.1.2. Applicability

The recommendations contained in the present document are applicable to the final servicing to ascertain acceptability of the product.

5.4.2. Relative documentation

20102900 Scheme of the VES MATIC 20 / 20 PLUS system (in the current version).

20102462 Electric scheme of the Printer Interface WT01 small.

30111340 Layout of the Printer Interface Board WT01 small

5.4.3. Relative instrumentation

Multimeter Mod. FLUKE 8010A or equivalent.

Philips Laboratory Oscilloscope or equivalent.

Standard laboratory welder.

3-4 mm screw-drivers, pliers, standard laboratory tools.

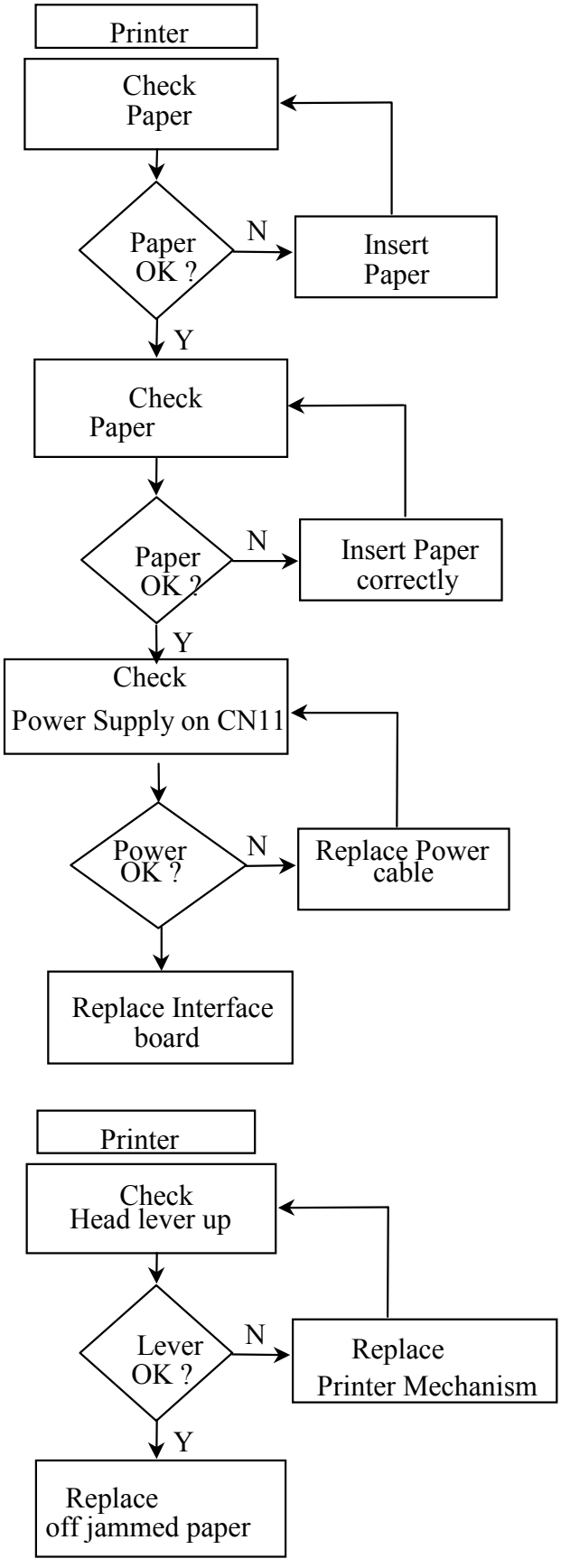
5.4.4. Trouble shooting

5.4.4.1. Description of the module

The intrerface printer module pos. 066, formed by an integrated circuit (U1) ATMEL AT908515, have to keep the printer mechanism, and the serial comunication with the instrument's cpu.
For to keep the printer mechanism we mean the paper feed, the keep of the sensorsof end paper and head up,the command of the thermic head dots.

5.4.5. Flow Chart no. 5

Interface module Trouble shooting.



5.4.6. Access to the module

a) Disconnect from the power supply, as in paragraph 1.

b) Open the outer covering (pos. 046)to gain access to the inside of the instrument and unscrew the screw pos.160, extract the printer module.

c) Disconnect the power supply cable on connector CN11.

d) Disconnect the serial cable connected on CN12.

e) Unscrew the screw pos. 158 , remove flex cable on the printer interface board (pos. 066)connect to the connector CN3 and CN4.

f) Remove the Printer Interface module from the unit by unscrewing the screws, see layout .

g) Remove the cable soldering in the printer interface board, connect whith the printer mechanism.

h) Substitute the faulty components, according to Appendix D.

Appendix D: Examination of the faults.

An examination of the main defects is performed according to the table reported below:

Type of failure	The printer does not print.
Local effect	The paper does not advance forward with the printed results.
General effect	Printing does not take place.
Action	Ensure that there is paper in the printer.

Type of failure	The power is present, but the printer does not print.
Local effect	The paper does not advance forward with the printed results.
General effect	The printer does not print.
Action	Check that the paper is inserted correctly and not jammed.

Type of failure	The paper is present and not jammed, but the printer does not print.
Local effect	The paper does not advance with the printed results.
General effect	The printer does not print.
Action	Check the power on CN11.

Type of failure	The printer does not print.
Local effect	The printer print in compress mode.
General effect	The printer does not print correctly.
Action	Check the mechanical parts and paper position.

Type of failure	The printer does not print.
Local effect	The motor feed remains blocked .
General effect	The printer does not print.
Action	Check the microswitch.and head lever position. Replace the board or printer mechanism.

5.5. SERVICE MANUAL MOTORS AND CONTROLS BOARD pos. 061

5.5.1. General

5.5.1.1. Aim

5.5.1.2. Applicability

5.5.2. Relative documentation

5.5.3. Relative instrumentation

5.5.4. Trouble shooting

5.5.4.1. Description of the module

5.5.5 Flow Chart no. 6

5.5.6. Access to the module

Appendix E: Examination of the faults.

5.5 SERVICE MANUAL MOTOTRS AND CONTROLS BOARD POS. 061

5.5.1 General

5.5.1.1. Aim

The present document reports in detail the Trouble Shooting procedures to be used in relation to the Motors and Controllers Board pos. 061, assembled on the VES MATIC 20 / 20 PLUS.

5.5.1.2. Applicability

The recommendations contained in the present document are applicable to the final servicing to ascertain acceptability of the product.

5.5.2. Relative documentation

20102900 Scheme of the VES MATIC 20 / 20 PLUS system (in the current version).

20102610 Electric scheme of the Motors and Controllers board.

30111650 Layout of the Motors and controllers board pos. 061.

5.5.3. Relative instrumentation

Multimeter Mod. FLUKE 8010A or equivalent.

Philips Laboratory Oscilloscope or equivalent.

Standard laboratory welder.

3-4 mm screw-drivers, pliers, standard laboratory tools.

Power supply pos. 072

CPU pos. 48

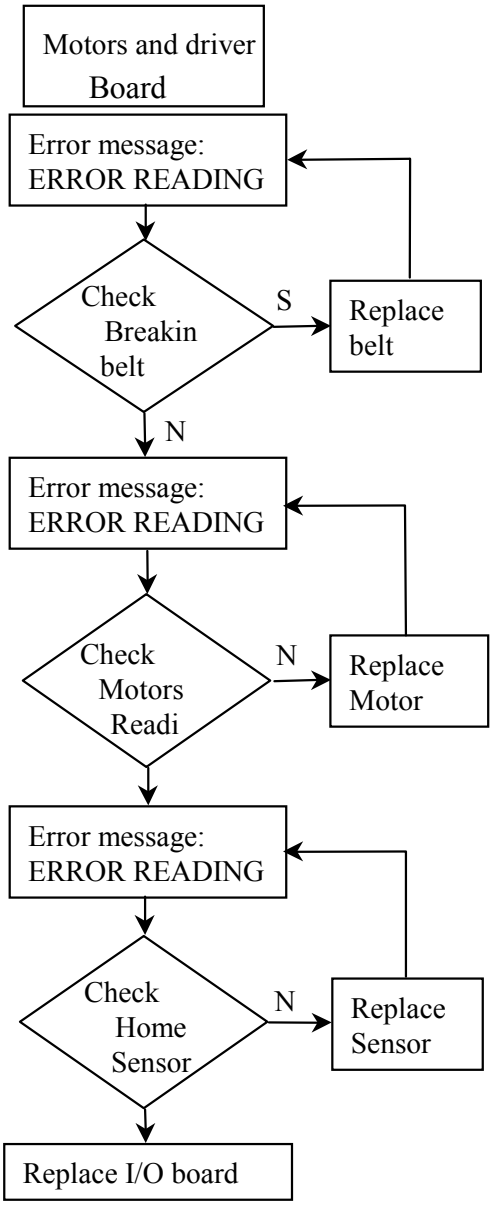
5.5.4. Trouble shooting

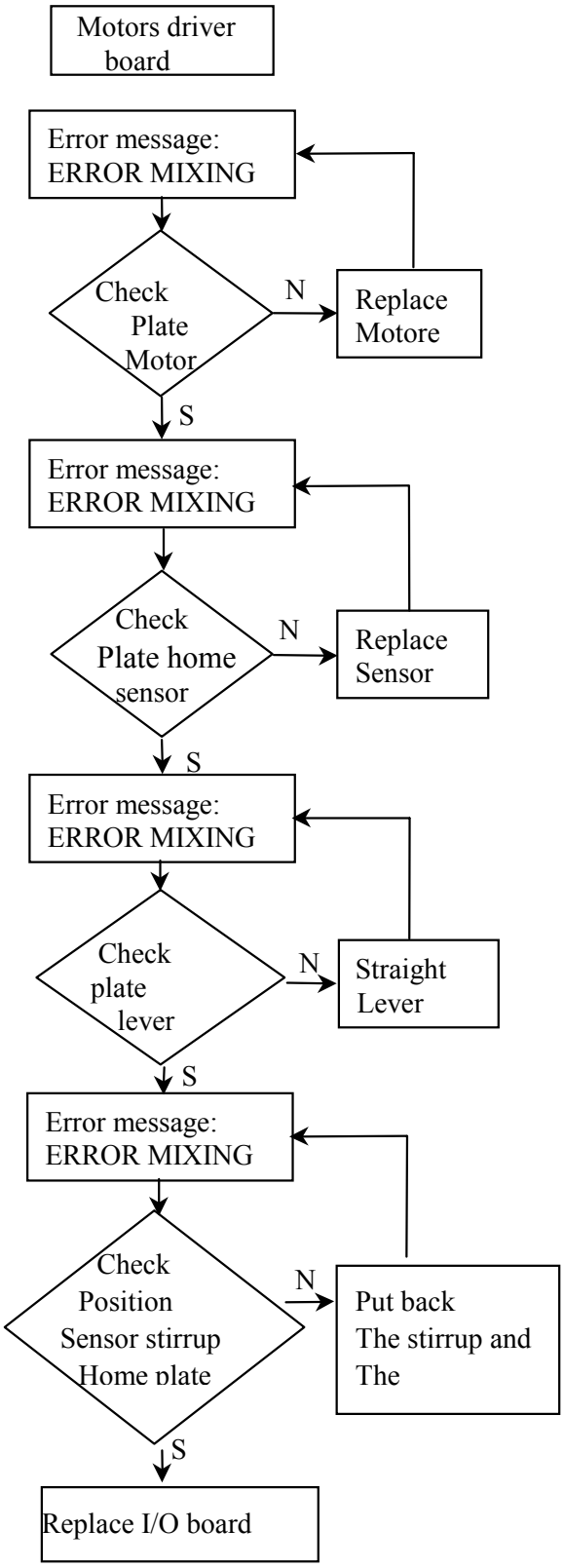
5.5.4.1. Description of the module

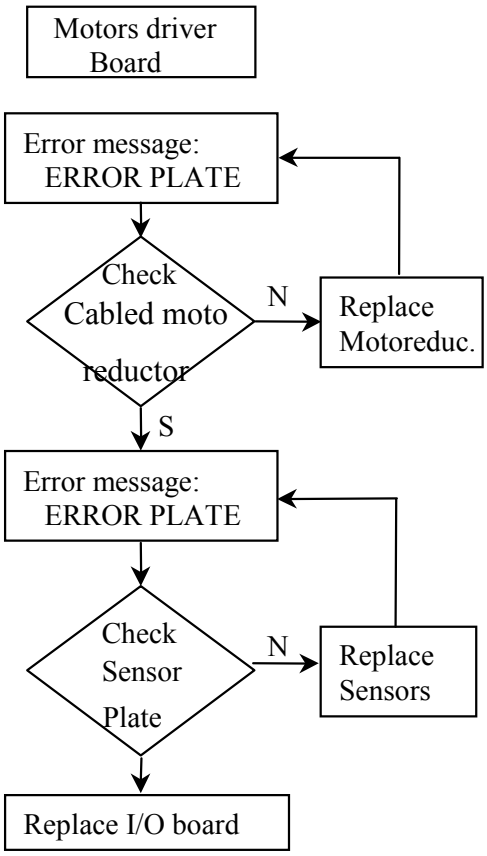
The Motors and Controls Board module of the VES MATIC 20 / VES MATIC 20 PLUS instrument is interfaced directly to the CPU pos. 048 from the connector CN9 and to the power via the connector CN10; the CPU must be connected in order for the module to function. This board controls the movement of the different motors actioning the sample plate, the control of the information deriving from the reading and home sensors, and of the traslator sensors position up and down.

5.5.5 Flow Chart no. 6

Trouble shooting phase in the Motors and Controls Board.







5.5.6. Access to the module

a) Disconnect from the power supply, as in paragraph 1.

b) Open the outer covering to gain access to the inside, as in paragraph 2.

c) Unscrew the screws pos. 098 and remove the case pos. 020.

d) Disconnect the interface cable connected on CN9 and CN10.

e) Disconnect the others connected cables.

f) Replace the faulty components, according to Appendix E.

Appendix E: Examination of the faults.

An examination of the main defects is performed according to the table reported below:

Type of failure	The Self-Test starts up with the error message: ERROR READING.
Local effect	The data is not read, or is read incorrectly.
General effect	Error message; the instrument does not start up.
Action	1. Check that the cord is not damaged; if so, replace. 2. Check the function of the Home Sensor. 3. Check the connections to the motor. 4. Replace the I/O Board.

Type of failure	The Self-Test starts up with the error emssage: ERROR PLATE.
Local effect	The data is not read, or is read incorrectly. The plate does not rotate 90°.
General effect	Error message; the instrument does not start up.
Action	1.Check the microswitch for the position of the plate; replace microswitch. 2.Check the connections and the state of the DC motor. 3. Replace the I/O Board.

Type of failure	The Self-Test starts up with the error message: ERROR MIXING.
Local effect	The data is not read, or is read incorrectly. The plate does not rotate on its axis, or moves in an anomalous manner.
General effect	Error message; the instrument does not start up.
Action	1.Check the connections to the plate motor. 2.Check yhe connections and state of the Sensor Home Plate, replace if necessary. 3.Replace the I/O Board.

Appendix F:

HOST COMPUTER CONNECTION FOR VES-MATIC LINE INSTRUMENTS AND VES-MATIC 20 / 20 PLUS COMMUNICATION PROTOCOL.

Check that the connection cables are 3 wire connectors (Tx-Rx-Gnd) and are connected as follows:

VES CONNECTOR	HOST-COMPUTER CONNECTOR	
Type DB9	Type DB9	Type DB25
2	2	3
3	3	2
5	5	7

SPECIFICATIONS FOR THE ASYNCHRONOUS SERIAL COMMUNICATION PROTOCOL

Representation of the bytes transmitted on the serial line:

STX	BLK	BLK	LEN	LEN	ADD	ADD	COM	COM	D1	...	Dn	ETX	CHK	CHK

Each box represents 1 byte transmitted on the serial port. The pair of bytes will instead be packed in the memory and return to the value of 1 byte.

STX : Character ASCII '>' 0x3E

BLK : Block Number

LEN : Number of characters, from D1 to Dn (included)

ADD : Device ID (00 and FF = Reserved) Available range 01-7F

COM : Command ID

If COM=COM+0x80, the end of the block is given by ETX and CHK is not controlled.

D1.Dn : Command related data

ETX : Character ASCII 'CR' 0x0D

CHK : CheckSum (XOR from STX to Dn included)

The reply to the protocol will have to be part of the receiving device:

ACK / NAK	ADD	ADD	ETX

ACK : Character ASCII 0x06

If the command block has been correctly interpreted according to the protocol specifications

NAK : Character ASCII 0x15

If the command block is not compliant with protocol specifications

ADD : Device ID

If data transaction requires the use of more blocks, these will be numbered in progressive order starting from 0. Every transmission of more blocks should end with a block with a length equivalent to zero.

VES20/30 SERIAL COMMANDS AND PARAMETER FORMAT

Each command is interpreted and receives as reply 'ACK'=[0x06]+ID+CR

If a syntax error occurs or an incorrect command is issued, the reply will be 'NACK'=[0x15]+ID+CR

0x01: Request of version

Example:

From Host

>00000181+CR+00 *Asks unit with ID '01' to run command '81' (that is command '01' without checksum control)*

From ESR

>00190101VES MATIC 20New Rel. 1.00+CR+10

0x02: Request list of stored tests

The returned data field is formed by the number of tests stored in ASCII hex format (2 bytes) followed by15 byte separated by ';' which specify the type, date and time of the test.

Example:

From Host

>00000182+CR+00 *Asks unit with ID '01' to run command '82' (that is command '02' without checksum control)*

From ESR

>0031010203F1 28/04 15:41;F2 28/04 15:49;F2K 28/04 16:13+CR+15

0x03: Request test transmission

Example:

From Host

>0002018303+CR+00 *Asks unit with ID '01' to run command '83' (that is command '02' without checksum control) with parameter '03' indicating the number of tests that should be received.*

From ESR

The reply can be formed by more blocks, depending on the quantity of information present in the test.

The unit transmits a 20 byte header with information regarding

- Type of test 1 byte (0x01=F1, 0x02=F2, 0x03=F1K, 0x04=F2K)

- *ESR settings during the reception 1byte (X X BO BE BI FP FD FT where FT= temperature correction flag 1 is ON, FD=Displayed results flag, FP=Printed results flag, BI=Internal bar code selection flag, BE=External bar code selection flag, BO= Barcode deselection flag)*
- *Number of samples 1 byte*
- *Cycle 1byte*
- *Temperature during test 1 byte*
- *Test date 10 byte hex-ascii*
- *Test time 5 byte hex-ascii*

Followed by a number of 40 byte fields equivalent to the "Number of samples" with the following format:

- *Position number 1 byte*
- *Status flag 1 byte*
- *Barcode 13 byte Hex-ascii*
- *ESR results 24 byte*
- *Katz index 1 byte*

Flag Status can acquire the following values:

- *0 x81* *Abnormal cuvette*
  High cuvette
- *0 x82* *Low cuvette*
  Empty cuvette
- *0 x84* *Ordinary cuvette*
- *0 x88*
- *0 x00*

If the test carried out is of type F1, the ESR results will be equivalent to the first byte of the 24. The Katz index shall not be taken into account.

If the test carried out is of type F2, the ESR results will be equivalent to the first two bytes of the 24. The Katz index will also be taken into account

If the test carried out is of type F1K, the ESR results will be equivalent to the first 12 bytes of the 24. The Katz index shall not be taken into account

If the test carried out is of type F2K, the ESR results will be within the first 24 bytes. The Katz index will also be taken into account.

0x04: Command to request the unit status

The unit status is constituted by 2 ASCII hex integers represented by means of two sets, each with 4 bytes.

The *first four* bytes contain the following information:

Bit value:

Bit	Code
0	Test type
1	Test type
2	Test type
3	Reset in progress
4	Check -Device expired
5	Open cover
6	Sample reading in progress
7	Mixing in progress
8	Centrifugation in progress
9	Test aborted
10	Error condition
11	- -
12	- -
13	- -
14	- -
15	- -

The three *Type of test* bits 0,1 and 2 represent:

- 0x01 F1 Normal
- 0x02 F2 Normal
- 0x03 F1 Kinetic
- 0x04 F2 Kinetic

The second group of 4 bytes represents the time in seconds needed to complete the test in progress.

Example:

From Host

Send command >00000184+CR+00 00 Ask the unit with ID '01' to run command '0x84' (that is command '0x04' without checksum control)

From ESR

>00080104008105CD+CR+4D

The status is codified as 0x0081, that is an ordinary F1 test in progress and a mixing stage in progress. The seconds needed to complete the test are 0x05CD, that is 1485 seconds.

0x05: Reading the Setting register

The unit returns the value of the setting register in 2 ASCII hex bytes.

The register bit have a Boolean value (1=ON)

Bit	Code
0	Temperature correction
1	Displayed results
2	Printed results
3	Internal barcode
4	External barcode
5	Disabled barcode
6	- -
7	- -

Example:

From Host

Send command >00000185+CR+00 00 Ask the unit with ID '01' to run command '0x85' (that is command '0x05' without check sum control)

From ESR

>0002010525+CR+3F

Consequently: temperature correction is ON, Printed results is ON and the Barcode is disabled.

0x06: Writing in the Setting register

This command enables to set the Setting register.

Example:

From Host

>0002018682+CR+00 Ask the unit with ID '01' to run command '0x86' with data field 0x82 (that is command '0x06' without checksum control). This sets: Temperature correction OFF, Displayed results ON, Printed results OFF, Internal barcode ON.

From ESR

*Replies **'ACK'** for positive results; otherwise it replies **'NACK'***

0x07: Start test

The command enables to start and select the type of test.

The type is codified as follows:

Type	Code
0x01	**F1 Normal**
0x02	**F2 Normal**
0x03	**F1 Kinetic**
0x04	**F2 Kinetic**

Example:

From Host

Sends command >0002018703+CR+00

Ask the unit with ID '01' to run command '0x87' with data field 0x03 (that is command '0x07' without checksum control). This start the F1 kinetic test.

From ESR

*Replies **'ACK'** for positive results; otherwise it replies **'NACK'***

0x08: Block analysis

The command enables to block the test in progress.

Example:

From Host

Send command >00000188+CR+00

Ask the unit with ID '01' to run command '0x88' (that is command '0x08' without checksum control).

From ESR

*Replies **'ACK'** for positive results; otherwise it replies **'NACK'***

0x09: Read Barcode

It reads the barcode stored in the requested position.

Positions range from 0 to 19 for VES20.

Example:

From Host

Send command >000201890D+CR+00

Ask the unit with ID '01' to run command '0x89' (that is command '0x09' without check sum control) with data field 0x0D, that is ask the barcode to be sent to position 13.

From ESR

>000D0109 . . . . . +6C

The units sends the 13 character code related to the requested barcode.

0x0A: Write barcode

This command enables the write the barcode in the desired position during the test cycle.

Positions range from 0 to 19 for VES20.

Example:

From Host

Send command >000F018A07ABCDEFGHILMNO+CR+00

Ask unit with ID '01' to run command '0x8A' (that is command '0x0A' without checksum control) with data field 07ABCDEFGHILMNO. This enables to write the bar code "ABCDEFGHILMNO" in position 0x07.

From ESR

'ACK'** if the reply is positive; otherwise **'NACK'

0x0B: Read Date and Time

This command enables to read the internal timer of the unit. The reply is formatted with 6 ASCII hex characters (12 byte) that refer to: hour, minutes, seconds, date, month and year.

Example:

From Host

Send command >0000018B+CR+00

Ask unit with ID '01' to run command '0x8B' (that is command '0x0B' without checksum control).

From ESR

>000C010B0B14040C0C00+CR+4D

The data field provides the following data: 11:20:04 hours with date 12/12/00

0x0C: Set date and time

This command enables to set the internal timer of the unit. The command data field is formatted with 6 ASCII hex characters (12 byte) that refer to: hour, minutes, seconds, date, month and year.

Example:

From Host

Send command >000C018C0C00000F0601+CR+00

Ask unit with ID '01' to run command '0x8C' (that is command '0x0C' without checksum control) with data field 0C00001F0601. This enables to set the timer at 12:00:00 hours and with a 15/06/01 date .

From ESR

'ACK'** if the reply is positive; otherwise **'NACK'

0x0D: Read Check-Device

The command returns the value of the formatted Check-Device as ASCII hex integer (4 byte).

Example:

From Host

Send command >0000018D+CR+00

Ask unit with ID '01' to run command '0x8D' (that is command '0x0D' without checksum control).

From ESR

>0004010D0F99+CR+39

The Check-Device value is 0x0F99, that is 3993

CONNECTING A BAR CODE READER TO VES 20/30 INSTRUMENTATION

The identification number of the samples (ID) can be entered manually or through the BAR CODE READER.

1. Before performing any connection, check that the presence of the following signals on the connector used for connection purposes (refer to the instruction manual of the bar code reader):

EXTERNAL DB9 CONNECTOR	SIGNAL
3	Data Rx from the scanner
5	GND
9	+ 5 V

2. Connecting the barcode reader to the unit

TECHNICAL INFORMATION:

The connection is performed using the 9-pin DB9 connector situated on the rear of the machine.

The electric levels of signals are RS232.

Communications are sent only from the bar code reader to the machine.

The baud rate is 9600 bit/s, the data format has 8 data bits, 1 stop bit and no parity bit.

The communication protocol is ASCII, the read bar code must end with a Carriage return character (0x0d).

Appendix H: FIRMWARE UPGRADE FOR THE VES MATIC 30 AND VES MATIC 30 PLUS INSTRUMENT

VES20NEW & VES30NEW

PROGRAMMING MANUAL

Ver. 1.1 - 23.07.01

PROGRAMMING SOFTWARE INSTALLATION

Create the folder C:\AVRTOOLS directly on C:
Copy the file Atmelisp.exe from floppy disk to C:\AVRTOOLS.
The file Atmelisp.exe is a compressed file that when started decompress all the files it contains.
To start the 'extraction' procedure start the program C:\AVRTOOLS\ATMELISP.EXE with double click.
Click the OK button when the extracting program (UnZip) warning you that the shareware release of the program isn't registred.
Then insert 'C:\' in the dialog box to set the destination of the extracted files.
Now all the files will be copied in the folder C:\AVRTOOLS\ATMELISP, ed it is possible to start the program ISP.EXE

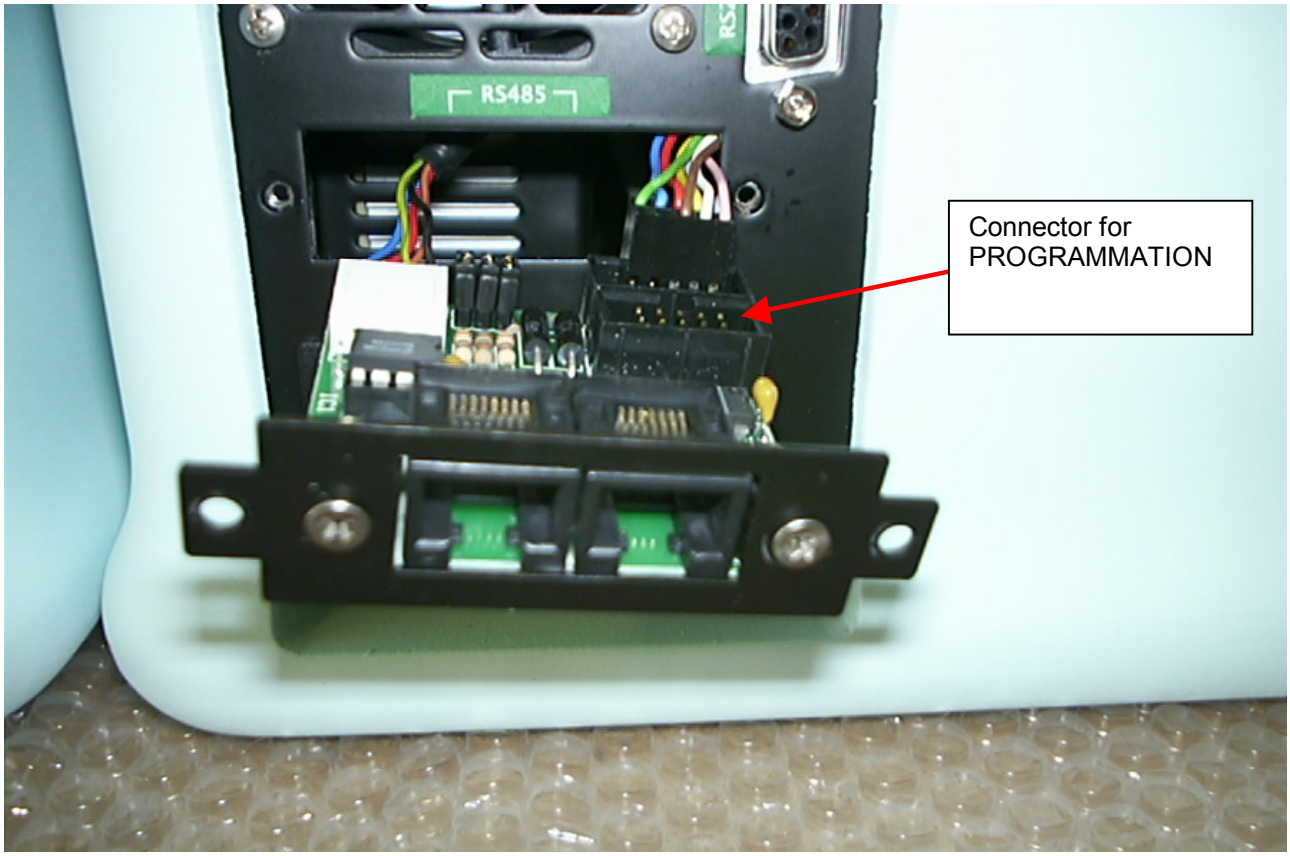
COPYING THE FILE TO BE TRANSFERRED TO VES20/30

Copy the file to be transferred in the memory of VES20/30 in the folder C:\AVRTOOLS\ATMELISP. The name of this file will be VES30.HEX for Vesmatic30 New and VES20.HEX for Vesmatic20 New. This contains the program of the instrument. The name of the file will remain the same for every new version of the program it contains.
So if it will be necessary to upgrade the instrument with a new program release a new file called VES30.HEX or VES20.HEX will be sent to you. Then you have to overwrite the old file with the new one.

PROGRAMMING THE INSTRUMENT VES20/30

Turn off the power switch and disconnect the mains cable.
Take off the screws that block the panel on the top of the mains switch and extract the panel. Be careful to not disconnect the internal cables. (see the photo)

Connect the Programming Cable included in the programming kit to the parallel port LPT1 of the Personal Computer. Connect the other side of the cable to the 10-ways male connector on the board fixed to the panel (see photo).



Connect the 9-ways D-sub male connector (Programming Key), included in the Programming Kit, to the female connector ‘RS232’ placed near the programming panel.
Insert the mains cable and turn on the Instrument.

PROGRAMMING PROCEDURE

Start the program ISP.EXE on the Personal Computer.
Select ‘Project’ from the main menu. And then select ‘Open Project’.
Browse the file VES30NEW.AVR in the folder C:\AVRTOOLS\ATMELISP and press OPEN.
Then three windows will open: ‘Project Manager’, ‘Program Memory’, and ‘EEPROM Memory’.

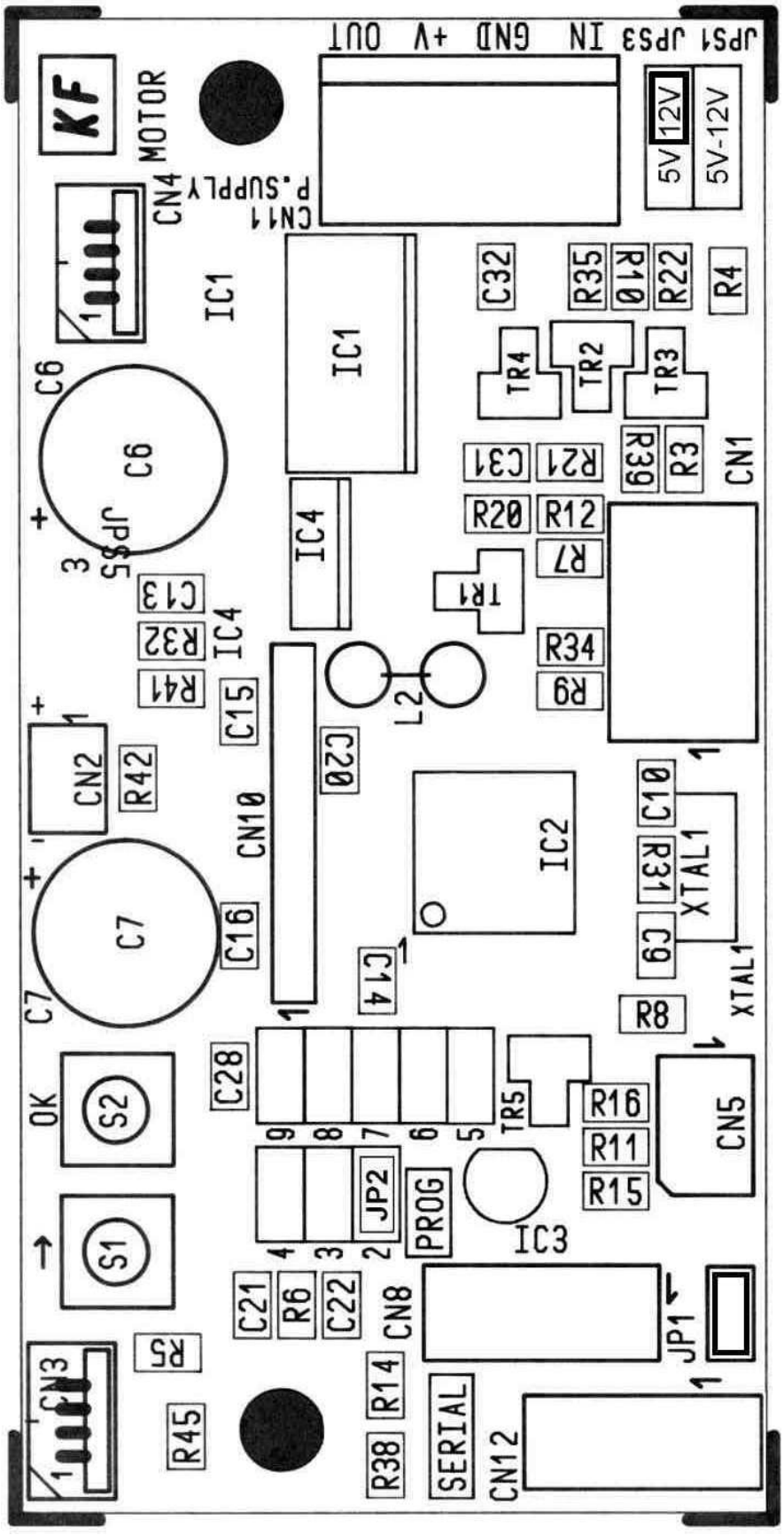
SAVING THE SETUP DATA OF THE INSTRUMENT

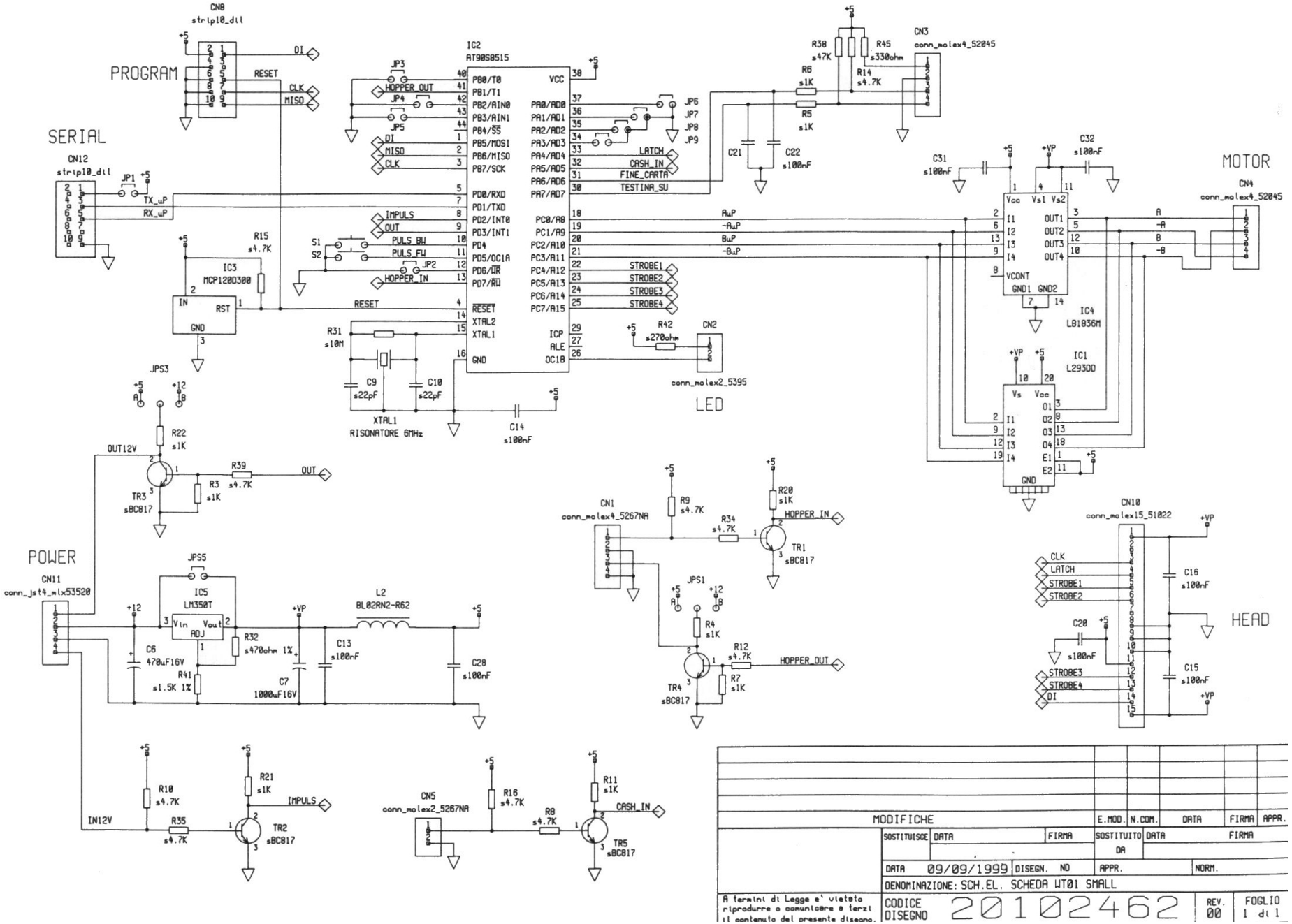
WARNING**: THE PROGRAMMING PROCEDURE WILL ERASE ALL THE MEMORY OF CPU, CAUSING THE LOST OF ALL SETUP DATA. BEFORE TO START PROGRAMMING YOU HAVE TO READ THE SETUP DATA FROM THE INSTRUMENT MEMORY AND THEN RESTORE IT AFTER THE DOWNLOAD OF THE PROGRAM.**
TO READ THE SETUP DATA FOLLOW THIS PROCEDURE:
Select Program from the main menu, and then ’Read EEPROM’.

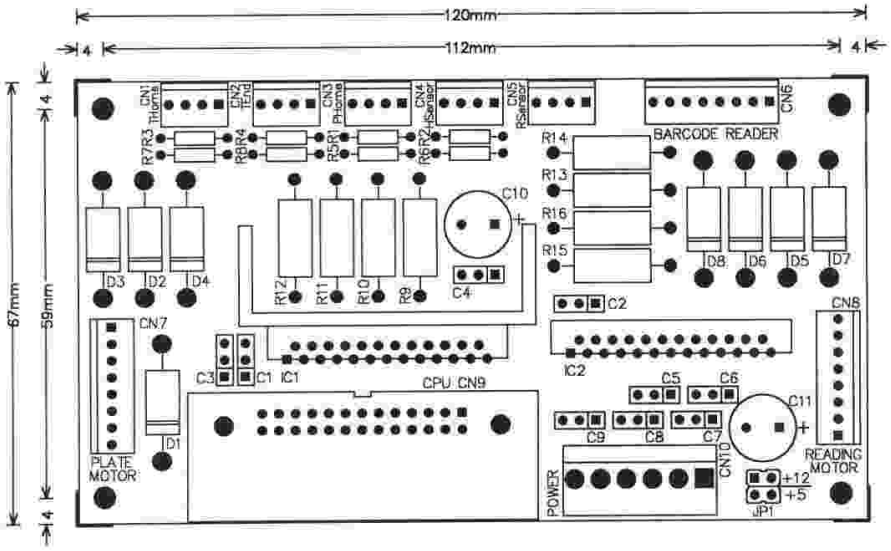
START PROGRAMMING

A. Select 'Program', and then 'Auto-Program Options'. Check on all the available options except 'Reload files' and 'Program Security bits' that must be de-selected and press OK.
B. Press F5 to start programming.
C. If during the procedure there are errors the program will inform you, otherwise no message will be displayed. If there are errors please check all the connections.
D. Close the program selecting 'Project' and then 'Close Project'. If the program ask you to save the EEPROM data always select No.
E. Exit the program selecting Project and then 'Exit'.

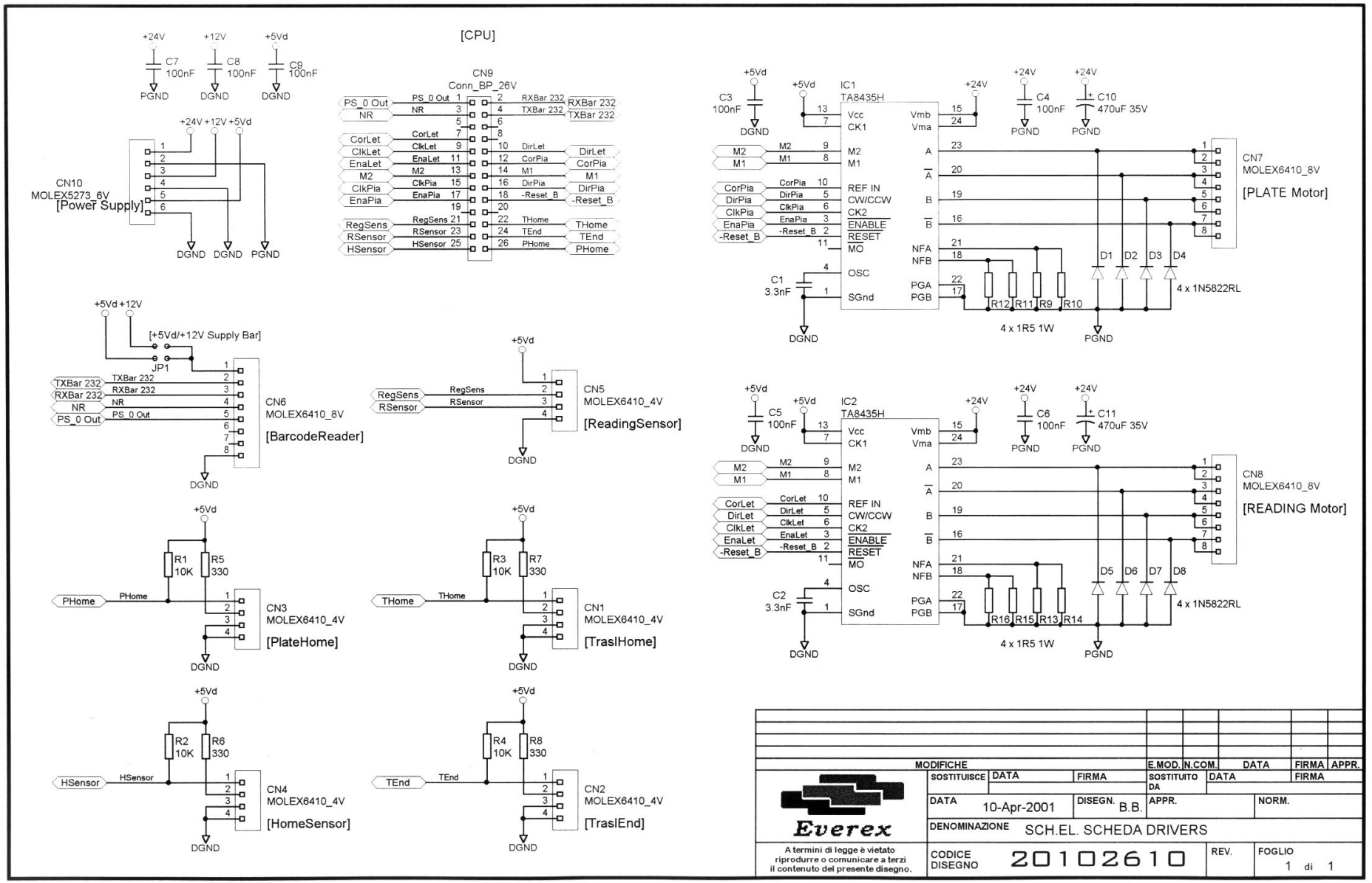
Appendix I: LAYOUT FOR ELECTRONIC CONTROL BOARD AND SCHEMATICS

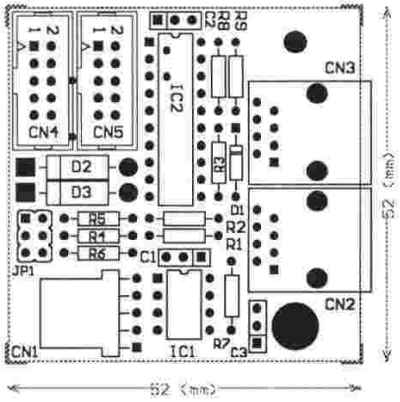



SERIAL
PROGRAM
POWER
MOTOR
HEAD
LED
IC2
AT90S8515
IC3
MCP1200300
IC4
L81836M
IC1
L293DD
IC5
LM350T
TR1
sBC817
TR2
sBC817
TR3
sBC817
TR4
sBC817
TR5
sBC817
CN1
conn_molex4_5267NA
CN2
conn_molex2_5395
CN3
conn_molex4_52045
CN4
conn_molex4_52045
CN5
conn_molex2_5267NA
CN8
strip10_dil
CN10
conn_molex15_51022
CN11
conn_jst4_mlx53520
CN12
strip10_dil
XTAL1
RISONATORE 6MHz
L2
BL02RN2-R62
DI
RESET
CLK
MISO
TX_uP
RX_uP
IMPULS
OUT
PULS_BW
PULS_FW
HOPPER_IN
HOPPER_OUT
LATCH
CASH_IN
FINE_CARTA
TESTINA_SU
STROBE1
STROBE2
STROBE3
STROBE4
AuP
-AuP
BuP
-BuP
OUT12V
IN12V
A
-A
B
-B
MODIFICHE
E.MOD.
N.COM.
DATA
FIRMA
APPR.
SOSTITUISCE
SOSTITUITO DA
DATA 09/09/1999
DISEGN. ND
APPR.
NORM.
DENOMINAZIONE: SCH.EL. SCHEDA WT01 SMALL
A termini di Legge e' vietato riprodurre o comunicare a terzi il contenuto del presente disegno.
CODICE DISEGNO 20102462
REV. 00
FOGLIO 1 di 1



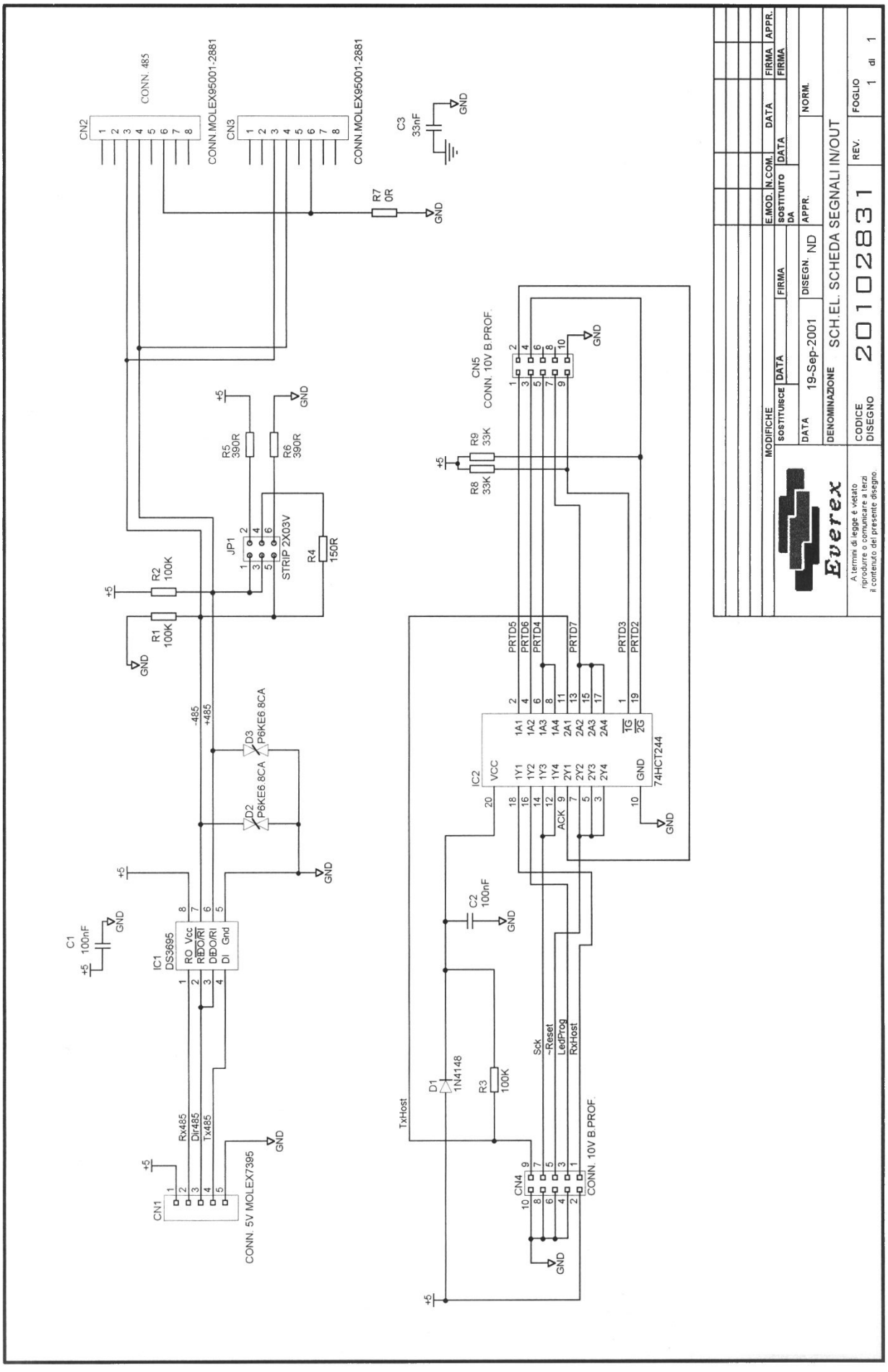
MODIFICHE								
LAVAGGIO	RASATURA h=			E.MOD.	N.COM.	DATA	FIRMA	APPR.
SCALE: 1.00	MATERIALE			FINITURA				
	SPESS. Cu			TRATT.				
	SOSTITUISCE	DATA :	FIRMA	SOSTITUITO DA	DATA			
					FIRMA			
EVEREX	DATA : 17-Apr-2001	DISEGN.		APPR.		NORM.		
	DENOMINAZIONE : SCHEDA DRIVERS MOTORI							
A termini di legge e' vietato riprodurre o comunicare a terzi il contenuto del presente disegno	CODICE DISEGNO	30111650		REV. 00	FOGLIO 1 DI 1			

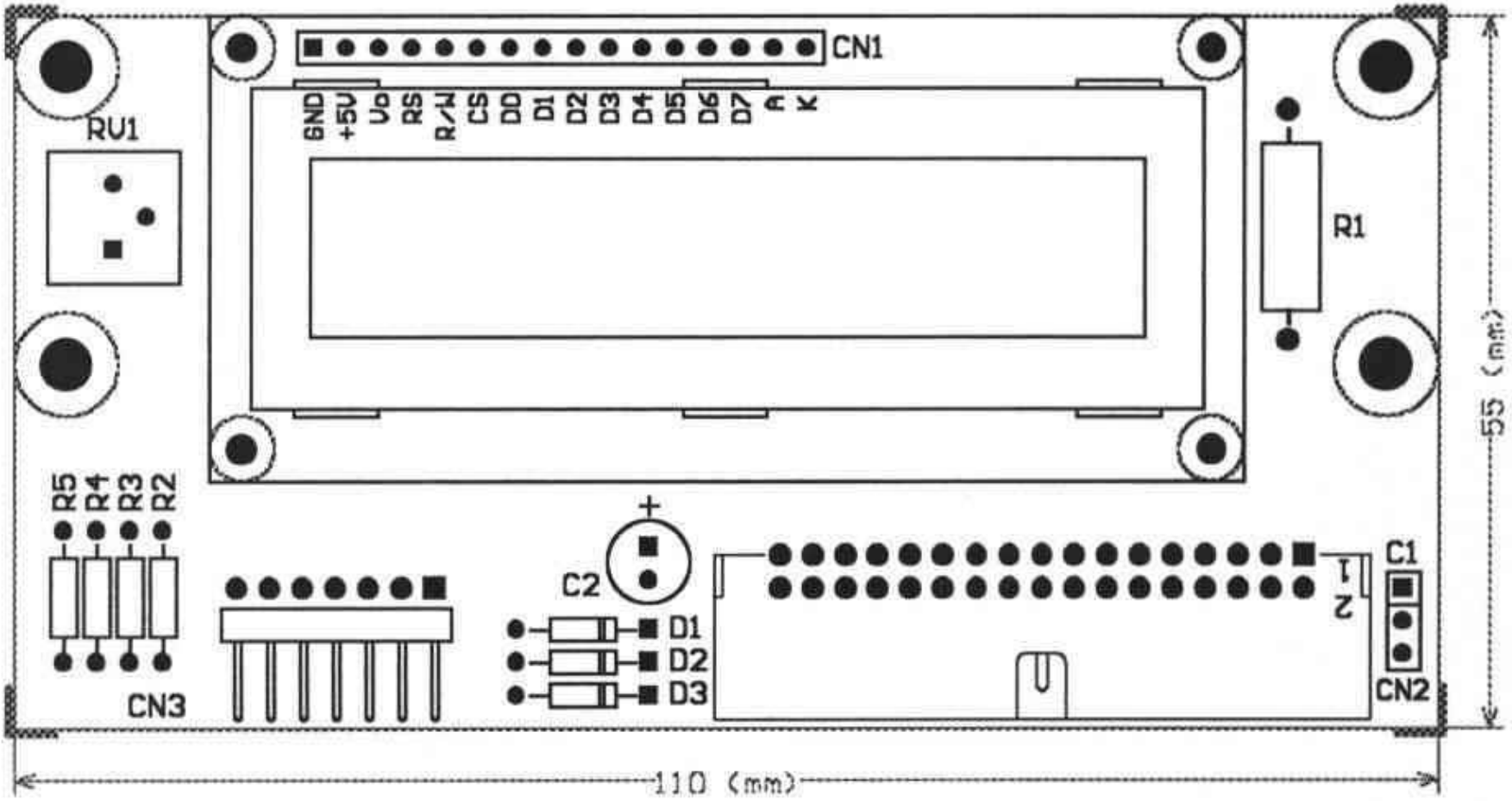

[CPU]
CN9
Conn_BP_26V
CN10
MOLEX5273_6V
[Power Supply]
IC1
TA8435H
IC2
TA8435H
CN7
MOLEX6410_8V
[PLATE Motor]
CN8
MOLEX6410_8V
[READING Motor]
CN6
MOLEX6410_8V
[BarcodeReader]
CN5
MOLEX6410_4V
[ReadingSensor]
CN3
MOLEX6410_4V
[PlateHome]
CN1
MOLEX6410_4V
[TraslHome]
CN4
MOLEX6410_4V
[HomeSensor]
CN2
MOLEX6410_4V
[TraslEnd]
JP1
[+5Vd/+12V Supply Bar]
4 x 1N5822RL
4 x 1R5 1W
MODIFICHE
SOSTITUISCE
SOSTITUITO DA
DATA
FIRMA
E.MOD.
N.COM.
APPR.
DISEGN. B.B.
10-Apr-2001
NORM.
DENOMINAZIONE
SCH.EL. SCHEDA DRIVERS
CODICE DISEGNO
20102610
REV.
FOGLIO
1 di 1
Everex
A termini di legge è vietato riprodurre o comunicare a terzi il contenuto del presente disegno.

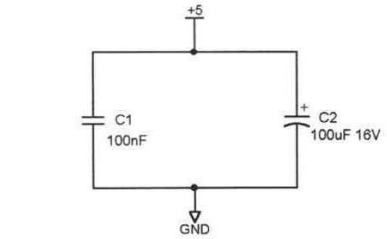


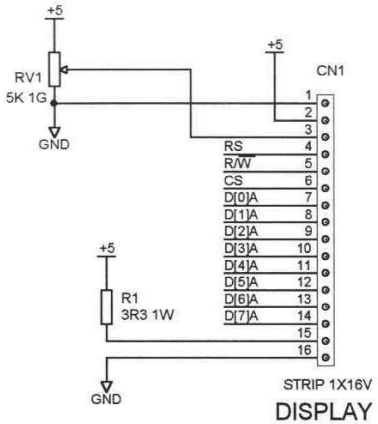
MODIFICHE						

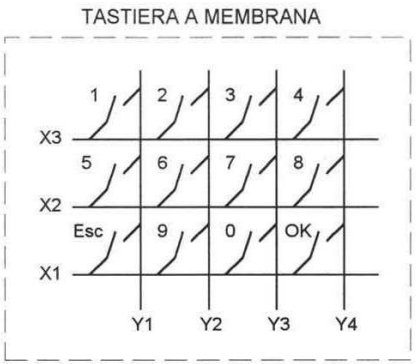
LAVAGGIO	RASATURA h=	E.MOD.	N.COM.	DATA	FIRMA	APPR.
SCALE: 1.00	MATERIALE	FINITURA				
	SPESS. Cu	TRATT.				
Everex S.r.l.	SOSTITUISCE DATA : FIRMA	SOSTITUITO DA DATA / FIRMA				
	DATA : 19--Sep--2001	DISEGN. ND	APPR.	NORM.		
	DENOMINAZIONE : SCHEDA SEGNALI IN/OUT RS485/PROG					
A termini di legge e' vietato riprodurre o comunicare a terzi il contenuto del presente disegno	CODICE DISEGNO 30113481	REV.	FOGLIO DI			

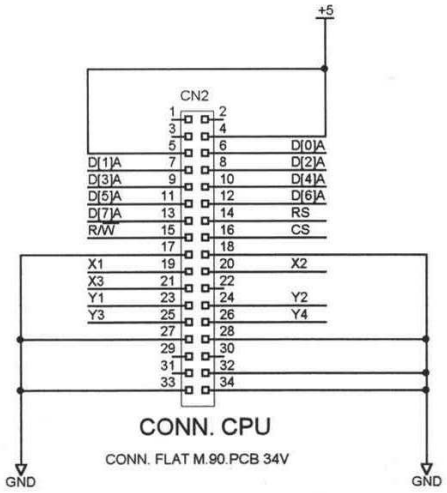

CN2
CONN. 485
CONN.MOLEX95001-2881
CN3
CONN.MOLEX95001-2881
R7
0R
C3
33nF
GND
+5
R5
390R
R6
390R
JP1
STRIP 2X03V
R4
150R
R2
100K
R1
100K
-485
+485
D3
P6KE6.8CA
D2
P6KE6.8CA
C1
100nF
IC1
DS3695
RO Vcc
RE/DI/RI
DE/DO/RI
DI Gnd
CN1
CONN. 5V MOLEX7395
Rx485
Dir485
Tx485
CN5
CONN. 10V B.PROF
R9
33K
R8
33K
IC2
74HCT244
VCC
GND
1A1
1A2
1A3
1A4
2A1
2A2
2A3
2A4
1Y1
1Y2
1Y3
1Y4
2Y1
2Y2
2Y3
2Y4
PRTD5
PRTD6
PRTD4
PRTD7
PRTD3
PRTD2
ACK
C2
100nF
D1
1N4148
R3
100K
TxHost
CN4
CONN. 10V B.PROF
Sck
~Reset
LedProg
RxHost
MODIFICHE
SOSTITUISCE
DATA
FIRMA
E.MOD.
N.COM.
DATA
FIRMA
APPR.
SOSTITUITO
DA
DATA
FIRMA
DATA 19-Sep-2001
DISEGN. ND
APPR.
NORM.
DENOMINAZIONE SCH.EL. SCHEDA SEGNALI IN/OUT
CODICE DISEGNO 20102831
REV.
FOGLIO 1 di 1
Everex
A termini di legge è vietato riprodurre o comunicare a terzi il contenuto del presente disegno.

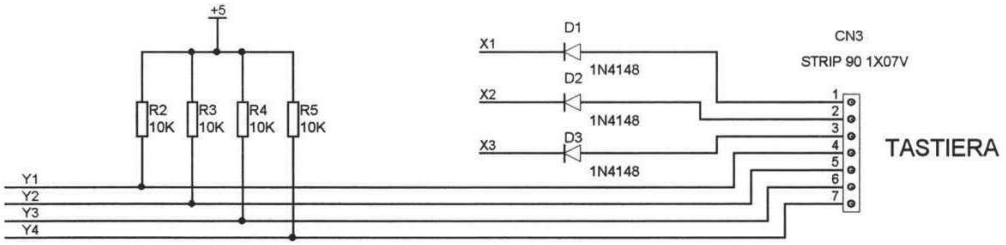

CN1
GND
+5V
Vo
RS
R/W
CS
DO
D1
D2
D3
D4
D5
D6
D7
A
K
RV1
R1
R5
R4
R3
R2
C2
D1
D2
D3
C1
CN2
CN3
55 (mm)
110 (mm)







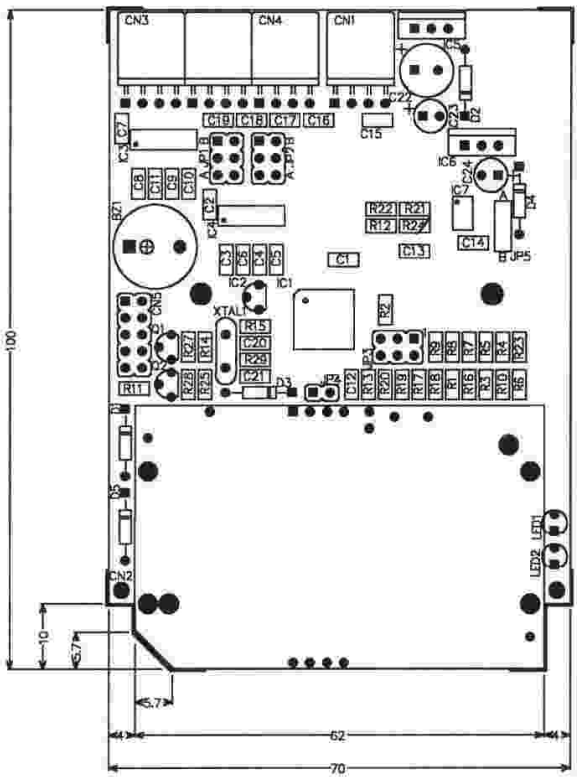




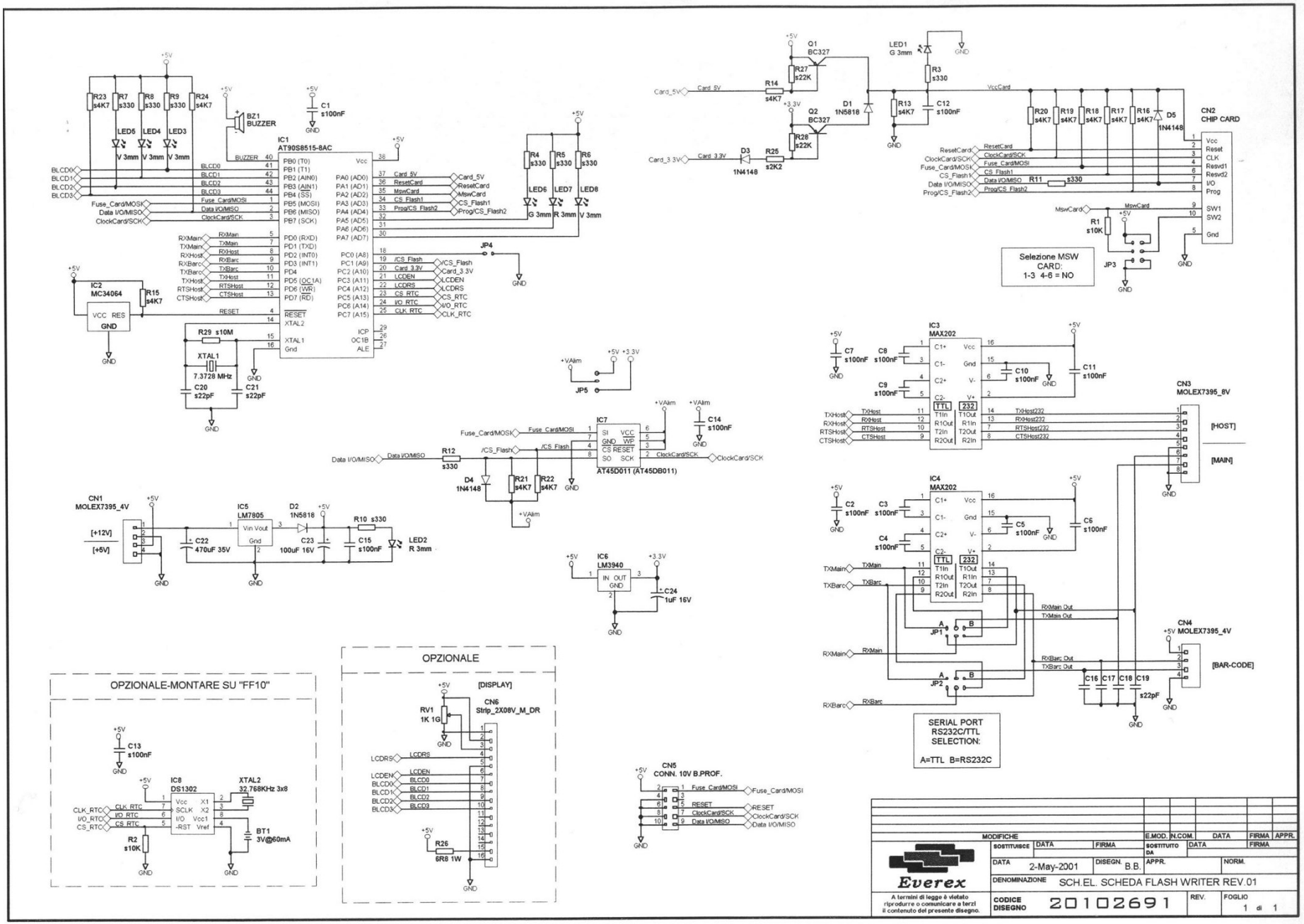
MODIFICHE					E.MOD.	N.COM.	DATA	FIRMA	APPR.
SOSTITUISCE	DATA	FIRMA			SOSTITUITO DA		DATA	FIRMA	
DATA 9-Apr-2001		DISEGN. ND			APPR.		NORM.		
DENOMINAZIONE SCH.EL. SCHEDA INTERF. DISPLAY + KEYB V20									
CODICE DISEGNO 20102850							REV.	FOGLIO 1 di 1	

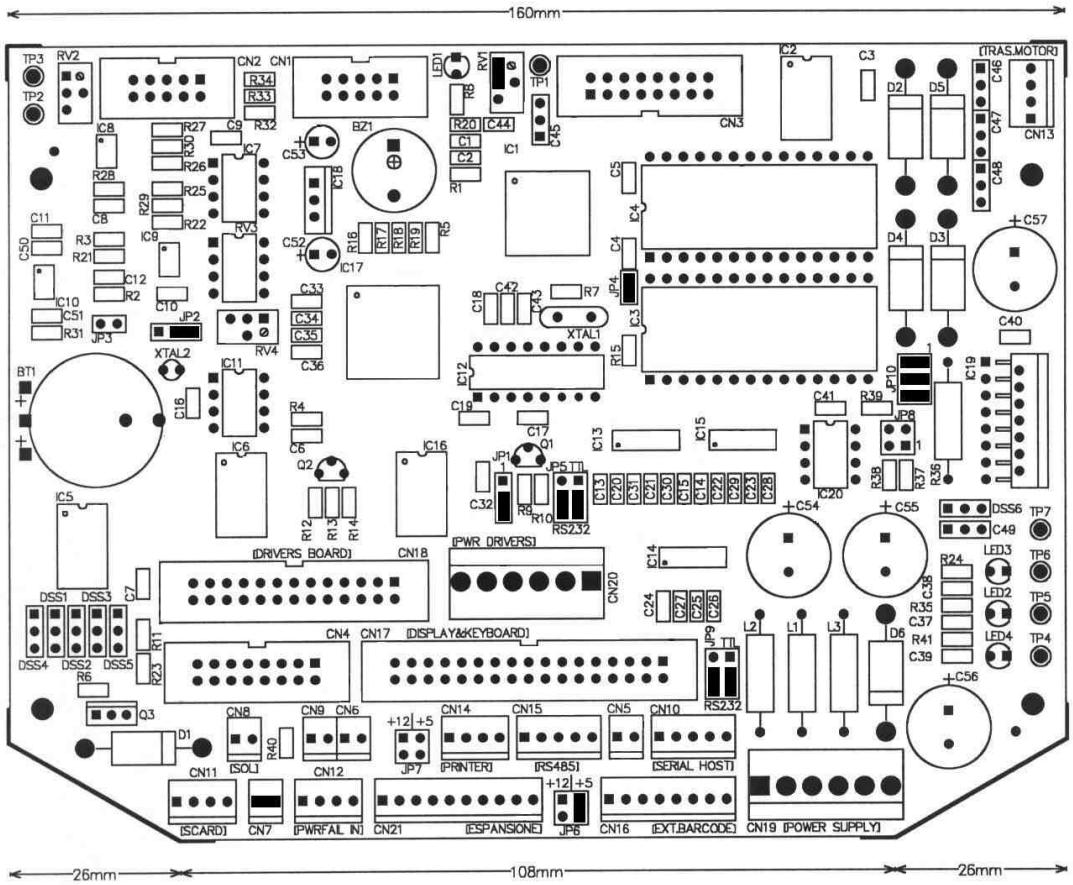
Everex

A termini di legge è vietato riprodurre o comunicare a terzi il contenuto del presente disegno.

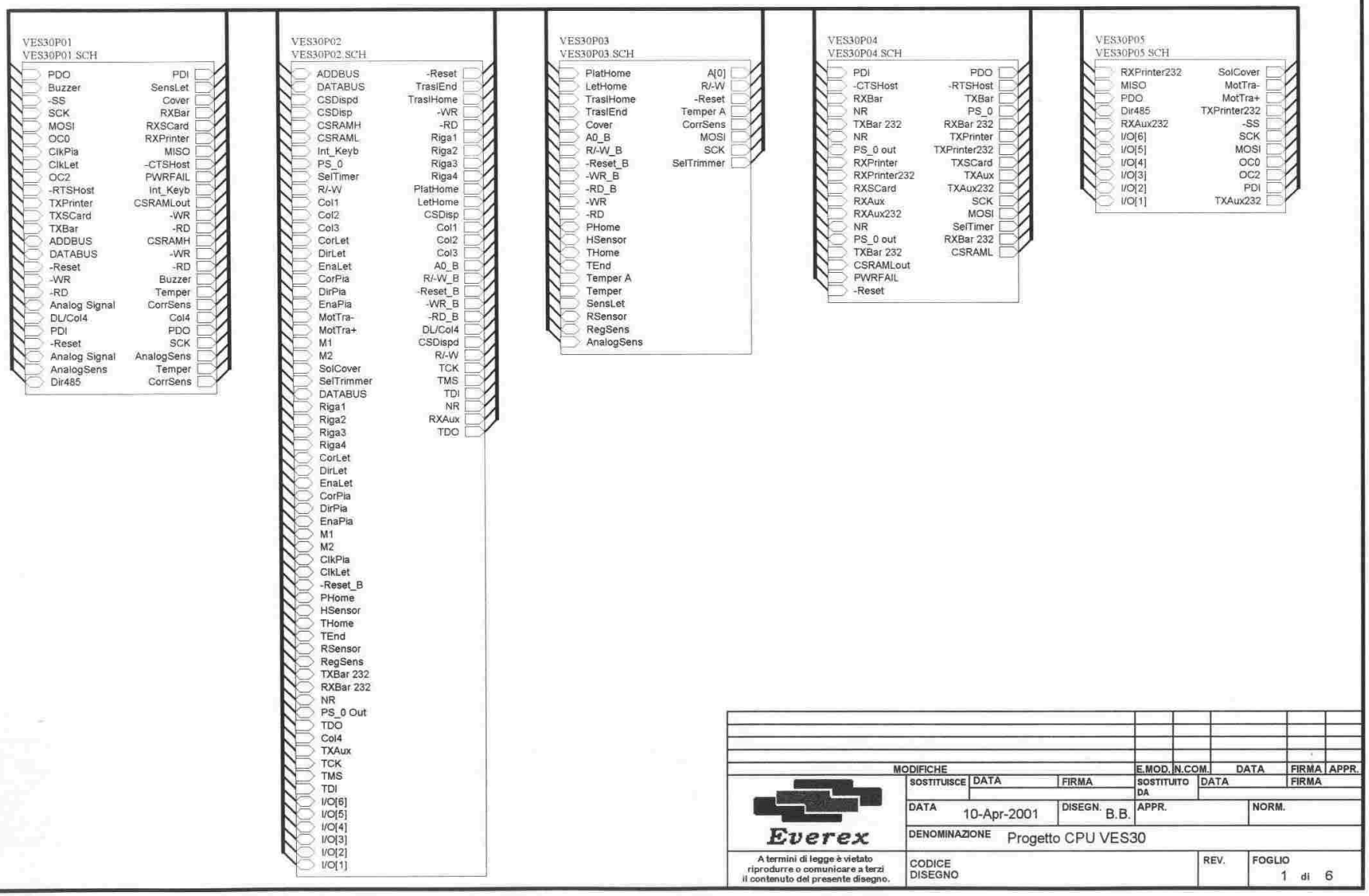


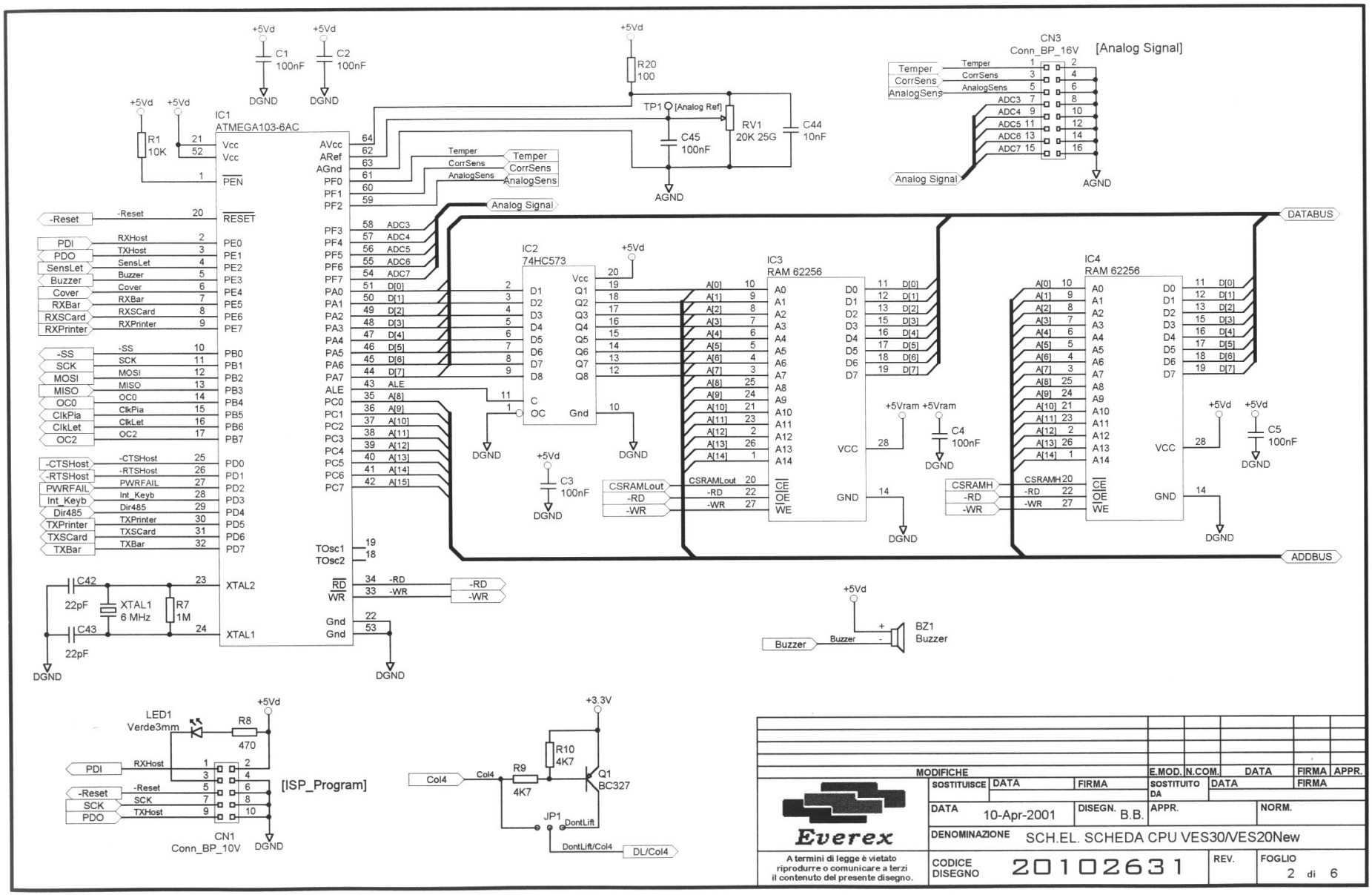
MODIFICHE							
LAVAGGIO	RASATURA h=		E.MOD.	N.COM.	DATA	FIRMA	APPR.
SCALE: 1.00	MATERIALE		FINITURA				
	SPESS. Cu		TRATT.				
EVEREX	SOSTITUISCE	DATA : FIRMA	SOSTITUITO DA	DATA FIRMA			
	DATA : 2-May-2001	DISEGN.	APPR.		NORM.		
	DENOMINAZIONE : SCHEDA FLASH WRITER REV.01 VERS.V230&V20N						
A termini di legge e' vietato riprodurre o comunicare a terzi il contenuto del presente disegno	CODICE DISEGNO 30114100		REV. 00	FOGLIO 1 DI 1			

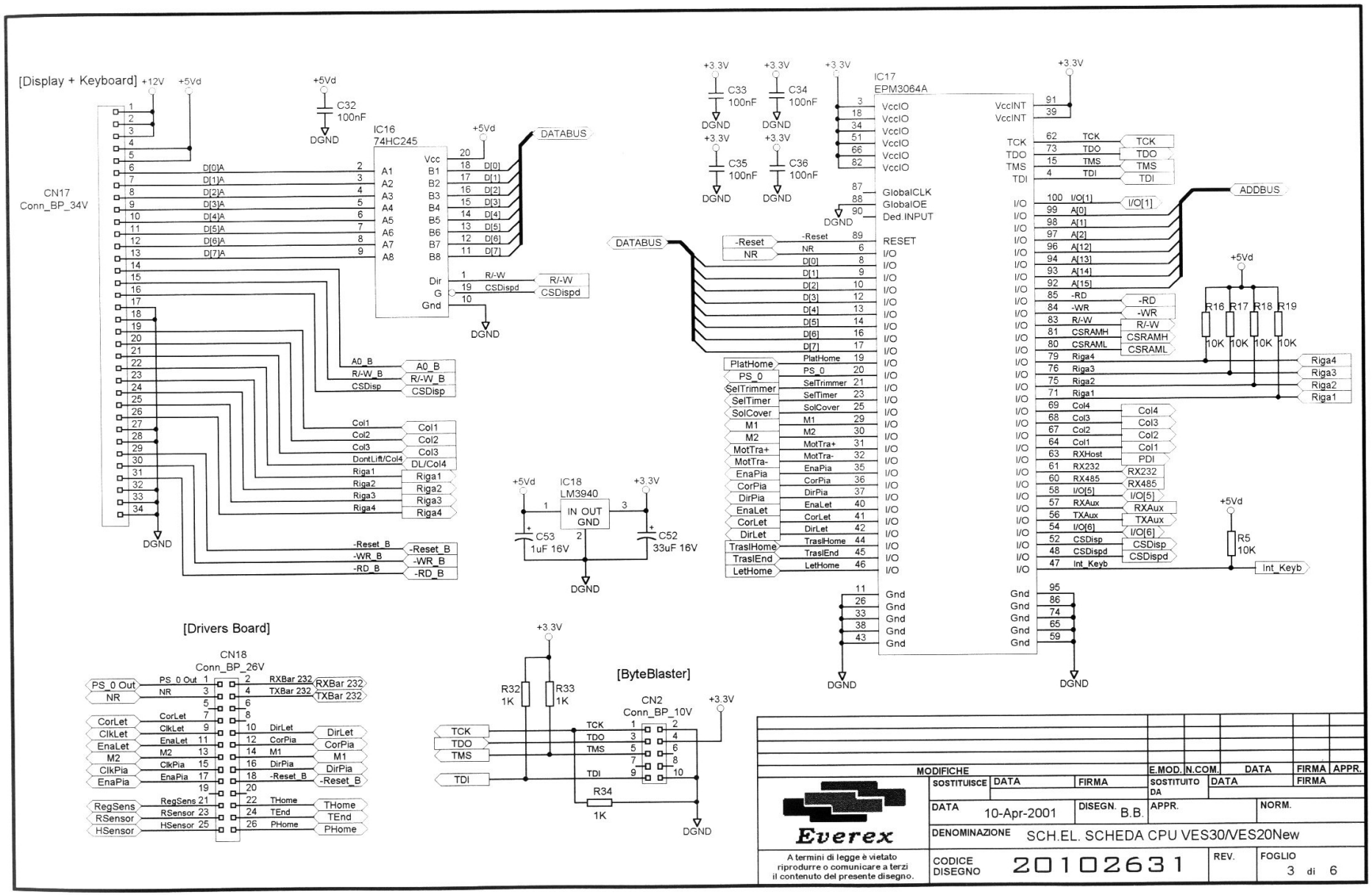

IC1
AT90S8515-8AC
IC2
MC34064
IC3
MAX202
IC4
MAX202
IC5
LM7805
IC6
LM3940
IC7
AT45D011 (AT45DB011)
IC8
DS1302
CN1
MOLEX7395_4V
[+12V]
[+5V]
CN2
CHIP CARD
CN3
MOLEX7395_6V
[HOST]
[MAIN]
CN4
MOLEX7395_4V
[BAR-CODE]
CN5
CONN. 10V B.PROF.
CN6
Strip_2X08V_M_DR
[DISPLAY]
BZ1
BUZZER
XTAL1
7.3728 MHz
XTAL2
32.768KHz 3x8
BT1
3V@60mA
Q1
BC327
Q2
BC327
D1
1N5818
D2
1N5818
D3
1N4148
D4
1N4148
D5
1N4148
JP1
JP2
JP3
JP4
JP5
Selezione MSW
CARD:
1-3 4-6 = NO
SERIAL PORT
RS232C/TTL
SELECTION:
A=TTL B=RS232C
OPZIONALE
OPZIONALE-MONTARE SU "FF10"
Everex
A termini di legge è vietato riprodurre o comunicare a terzi il contenuto del presente disegno.
MODIFICHE
SOSTITUISCE
SOSTITUITO DA
DATA
FIRMA
E.MOD.
N.COM.
APPR.
DISEGN. B.B.
NORM.
DENOMINAZIONE
SCH.EL. SCHEDA FLASH WRITER REV.01
CODICE DISEGNO
20102691
REV.
FOGLIO
1 di 1

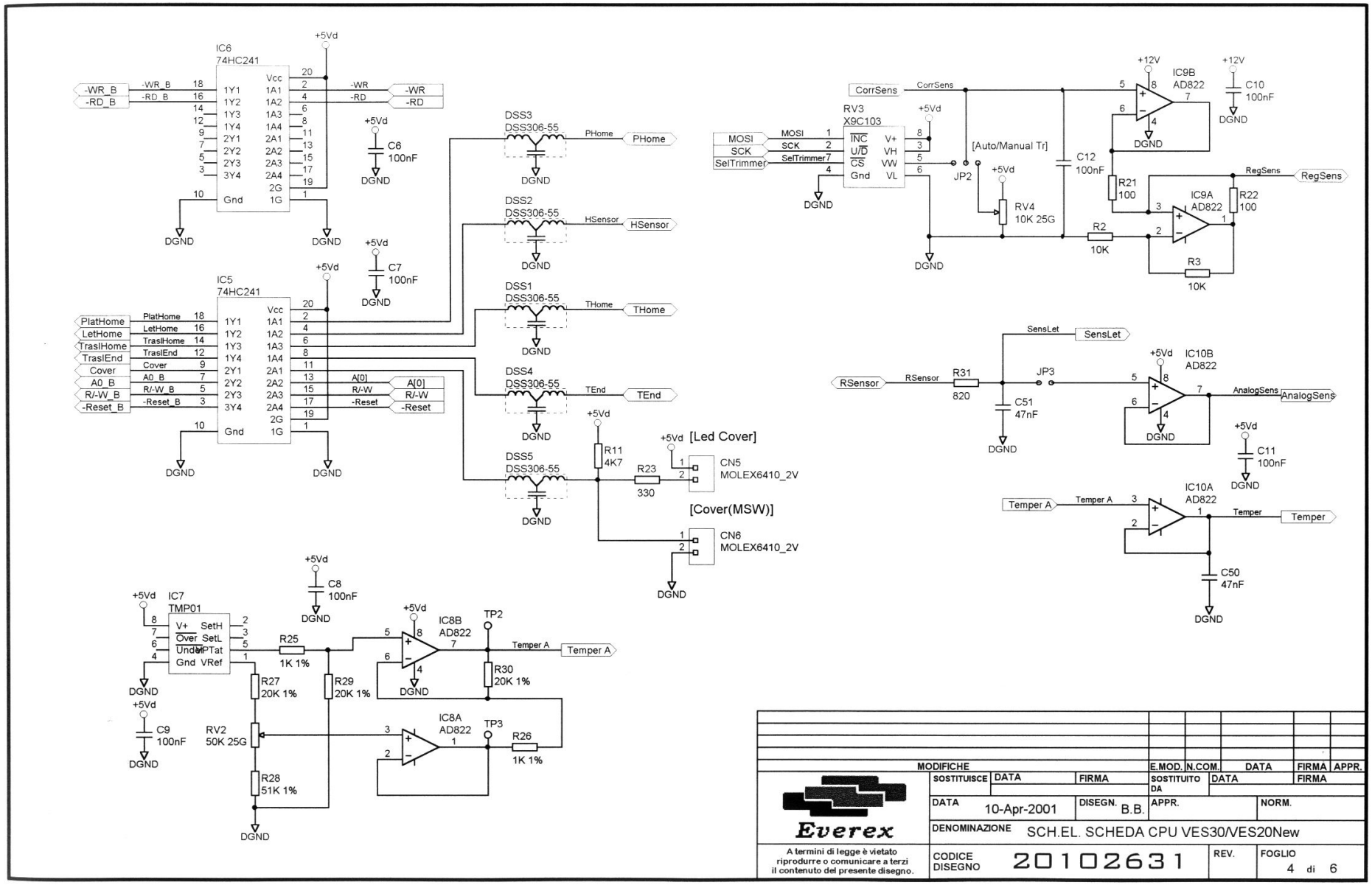


MODIFICHE	NOTA DI MONTAGGIO:						
	Ponticelli a saldare su RV1,JP10 e CN7						
LAVAGGIO	RASATURA h=			E.MOD.	N.COM.	DATA	FIRMA	APPR.
	SCALE: 1.00	MATERIALE		FINITURA				
		SPESS. Cu		TRATT.				
	EVEREX	SOSTITUISCE	DATA : FIRMA	SOSTITUITO DA	DATA			
					FIRMA			
		DATA : 17-Apr-2001	DISEGN.	APPR.		NORM.		
		DENOMINAZIONE : SCHEDA CPU VES230&VES20New						
	A termini di legge e' vietato riprodurre o comunicare a terzi il contenuto del presente disegno	CODICE DISEGNO	30112281	REV. 00	FOGLIO 1 DI 1		


VES30P01
VES30P01.SCH
PDO
Buzzer
-SS
SCK
MOSI
OC0
ClkPia
ClkLet
OC2
-RTSHost
TXPrinter
TXSCard
TXBar
ADDBUS
DATABUS
-Reset
-WR
-RD
Analog Signal
DL/Col4
PDI
-Reset
Analog Signal
AnalogSens
Dir485
PDI
SensLet
Cover
RXBar
RXSCard
RXPrinter
MISO
-CTSHost
PWRFAIL
Int_Keyb
CSRAMLout
-WR
-RD
CSRAMH
-WR
-RD
Buzzer
Temper
CorrSens
Col4
PDO
SCK
AnalogSens
Temper
CorrSens
VES30P02
VES30P02.SCH
ADDBUS
DATABUS
CSDispd
CSDisp
CSRAMH
CSRAML
Int_Keyb
PS_0
SelTimer
R/-W
Col1
Col2
Col3
CorLet
DirLet
EnaLet
CorPia
DirPia
EnaPia
MotTra-
MotTra+
M1
M2
SolCover
SelTrimmer
DATABUS
Riga1
Riga2
Riga3
Riga4
CorLet
DirLet
EnaLet
CorPia
DirPia
EnaPia
M1
M2
ClkPia
ClkLet
-Reset_B
PHome
HSensor
THome
TEnd
RSensor
RegSens
TXBar 232
RXBar 232
NR
PS_0 Out
TDO
Col4
TXAux
TCK
TMS
TDI
I/O[6]
I/O[5]
I/O[4]
I/O[3]
I/O[2]
I/O[1]
-Reset
TraslEnd
TraslHome
-WR
-RD
Riga1
Riga2
Riga3
Riga4
PlatHome
LetHome
CSDisp
Col1
Col2
Col3
A0_B
R/-W_B
-Reset_B
-WR_B
-RD_B
DL/Col4
CSDispd
R/-W
TCK
TMS
TDI
NR
RXAux
TDO
VES30P03
VES30P03.SCH
PlatHome
LetHome
TraslHome
TraslEnd
Cover
A0_B
R/-W_B
-Reset_B
-WR_B
-RD_B
-WR
-RD
PHome
HSensor
THome
TEnd
Temper A
SensLet
Temper
RSensor
RegSens
AnalogSens
A[0]
R/-W
-Reset
Temper A
CorrSens
MOSI
SCK
SelTrimmer
VES30P04
VES30P04.SCH
PDI
-CTSHost
RXBar
NR
TXBar 232
NR
PS_0 out
RXPrinter
RXPrinter232
RXSCard
RXAux
RXAux232
NR
PS_0 out
TXBar 232
CSRAMLout
PWRFAIL
-Reset
PDO
-RTSHost
TXBar
PS_0
RXBar 232
TXPrinter
TXPrinter232
TXSCard
TXAux
TXAux232
SCK
MOSI
SelTimer
RXBar 232
CSRAML
VES30P05
VES30P05.SCH
RXPrinter232
MISO
PDO
Dir485
RXAux232
I/O[6]
I/O[5]
I/O[4]
I/O[3]
I/O[2]
I/O[1]
SolCover
MotTra-
MotTra+
TXPrinter232
-SS
SCK
MOSI
OC0
OC2
PDI
TXAux232
MODIFICHE
E.MOD.
N.COM.
DATA
FIRMA
APPR.
SOSTITUISCE
DATA
FIRMA
SOSTITUITO DA
DATA
FIRMA
Everex
DATA
10-Apr-2001
DISEGN.
B.B.
APPR.
NORM.
DENOMINAZIONE
Progetto CPU VES30
A termini di legge è vietato riprodurre o comunicare a terzi il contenuto del presente disegno.
CODICE DISEGNO
REV.
FOGLIO
1 di 6


IC1
ATMEGA103-6AC
IC2
74HC573
IC3
RAM 62256
IC4
RAM 62256
CN1
Conn_BP_10V
CN3
Conn_BP_16V
[Analog Signal]
[ISP_Program]
DATABUS
ADDBUS
Analog Signal
Everex
SCH.EL. SCHEDA CPU VES30/VES20New
20102631
10-Apr-2001
B.B.
2 di 6

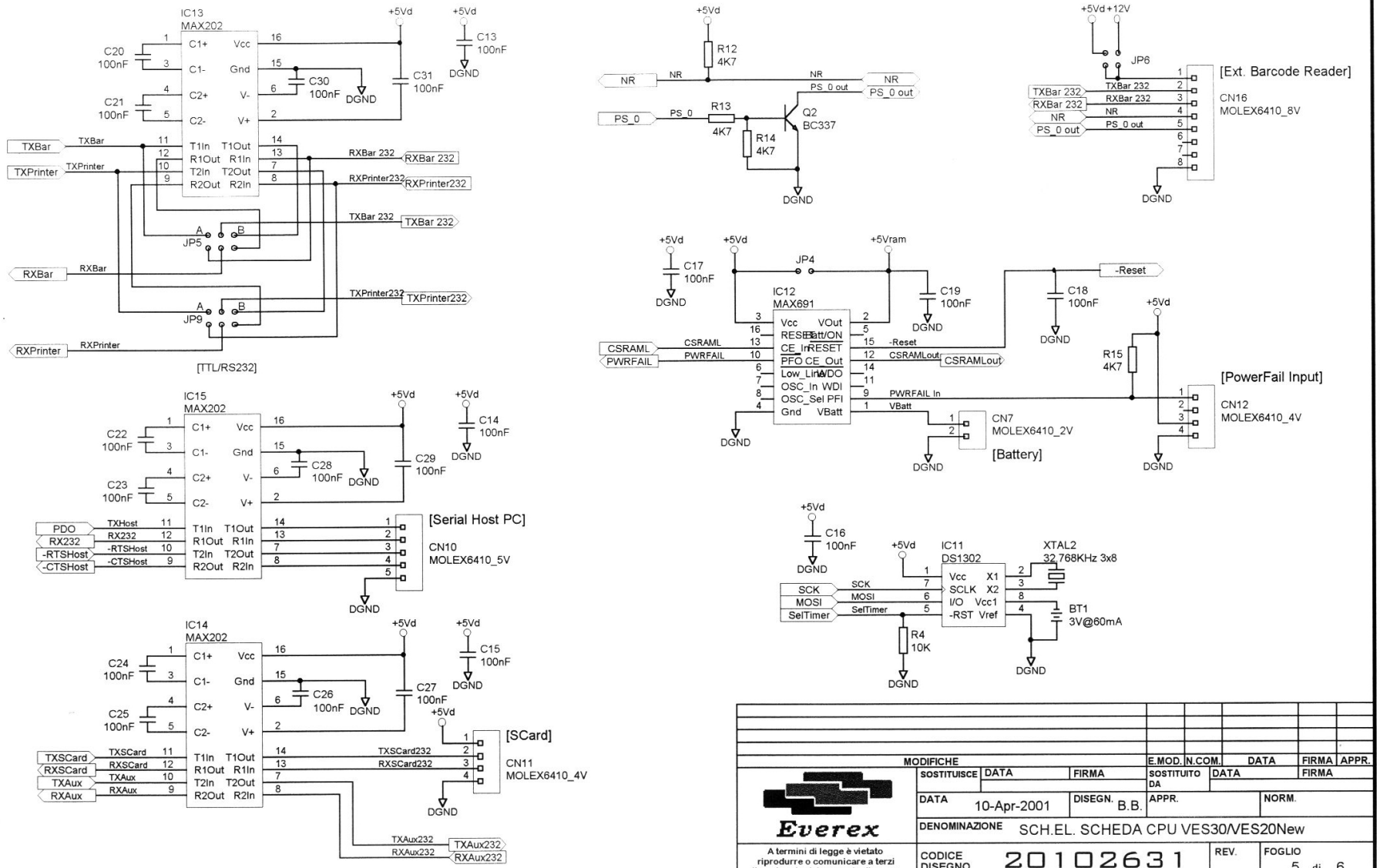

[Display + Keyboard]
CN17
Conn_BP_34V
IC16
74HC245
IC17
EPM3064A
IC18
LM3940
[Drivers Board]
CN18
Conn_BP_26V
[ByteBlaster]
CN2
Conn_BP_10V
DATABUS
ADDBUS
DGND
+5Vd
+3.3V
+12V
C32 100nF
C33 100nF
C34 100nF
C35 100nF
C36 100nF
C53 1uF 16V
C52 33uF 16V
R16 R17 R18 R19 10K
R5 10K
R32 1K
R33 1K
R34 1K
MODIFICHE
SOSTITUISCE
SOSTITUITO DA
DATA
FIRMA
E.MOD.
N.COM.
APPR.
DISEGN. B.B.
NORM.
Everex
DENOMINAZIONE SCH.EL. SCHEDA CPU VES30/VES20New
CODICE DISEGNO 20102631
REV.
FOGLIO 3 di 6
A termini di legge è vietato riprodurre o comunicare a terzi il contenuto del presente disegno.



MODIFICHE					E.MOD.	N.COM.	DATA	FIRMA	APPR.
SOSTITUISCE	DATA		FIRMA		SOSTITUITO DA		DATA	FIRMA	
DATA	10-Apr-2001	DISEGN.	B.B.		APPR.		NORM.		
DENOMINAZIONE	SCH.EL. SCHEDA CPU VES30/VES20New								
CODICE DISEGNO	20102631				REV.		FOGLIO	4 di 6	

Everex

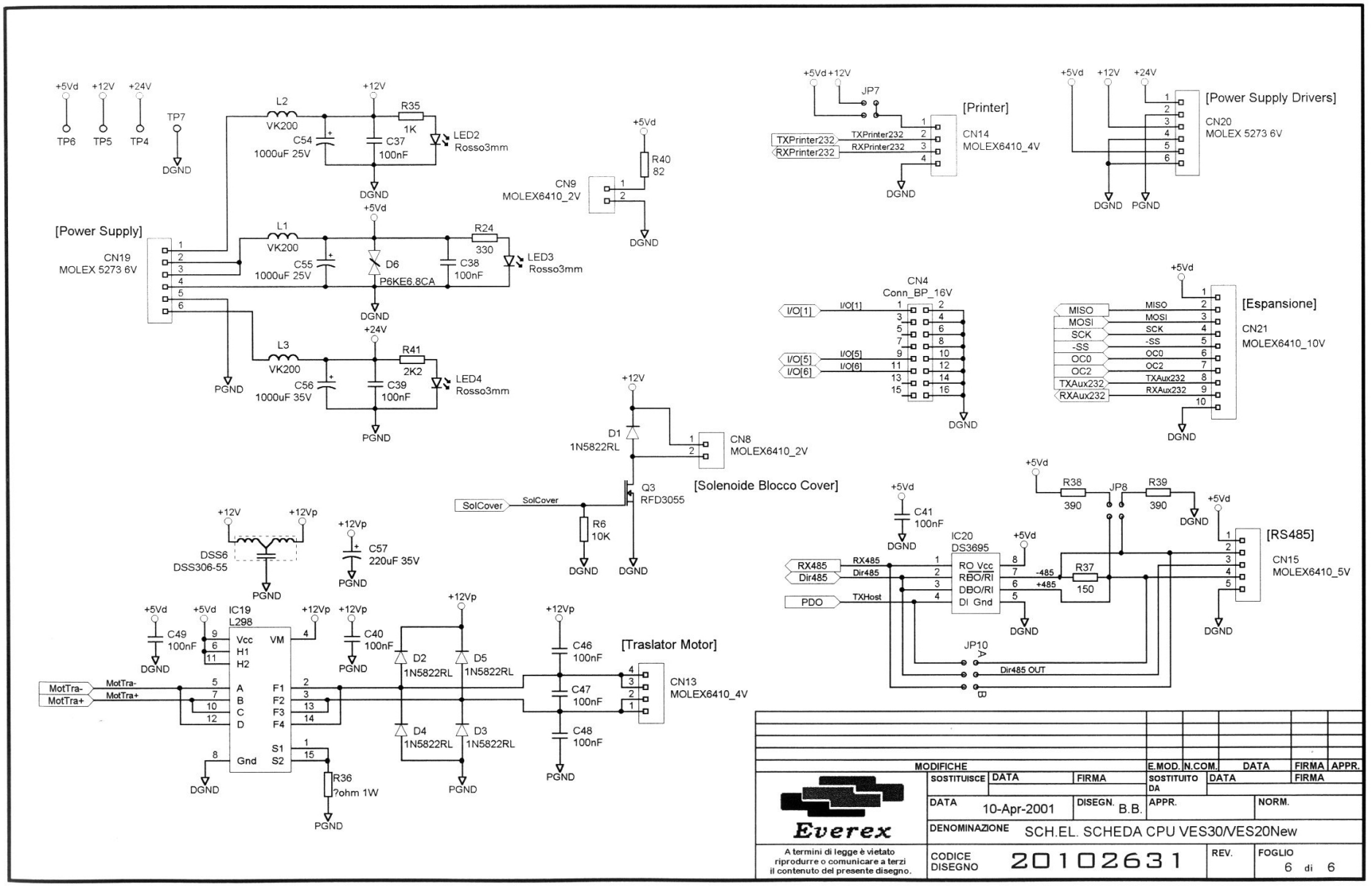
A termini di legge è vietato riprodurre o comunicare a terzi il contenuto del presente disegno.



MODIFICHE	E.MOD.	N.COM.	DATA	FIRMA	APPR.
SOSTITUISCE DATA / FIRMA	SOSTITUITO DA		DATA	FIRMA	
DATA 10-Apr-2001	DISEGN. B.B.	APPR.	NORM.		
DENOMINAZIONE SCH.EL. SCHEDA CPU VES30/VES20New					
CODICE DISEGNO 20102631	REV.	FOGLIO 5 di 6			

Everex

A termini di legge è vietato riprodurre o comunicare a terzi il contenuto del presente disegno.



MODIFICHE			E.MOD.	N.COM.	DATA	FIRMA	APPR.
SOSTITUISCE	DATA	FIRMA	SOSTITUITO DA		DATA	FIRMA	
DATA 10-Apr-2001	DISEGN. B.B.		APPR.		NORM.		
DENOMINAZIONE SCH.EL. SCHEDA CPU VES30/VES20New							
CODICE DISEGNO 20102631			REV.		FOGLIO 6 di 6		

Everex

A termini di legge è vietato riprodurre o comunicare a terzi il contenuto del presente disegno.